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Aerodynamic Influence Coefficients
from Supersonic Strip Theory:
Analytical Development
and Computational Procedure

1 AUGUST 1962

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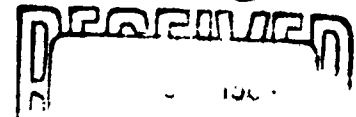
Laboratories Division

Prepared for COMMANDER SPACE SYSTEMS DIVISION

UNITED STATES AIR FORCE

Inglewood, California

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LABORATORIES DIVISION • AEROSPACE CORPORATION

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(6) AERODYNAMIC INFLUENCE COEFFICIENTS FROM
SUPERSONIC STRIP THEORY: ANALYTICAL DEVELOPMENT
AND COMPUTATIONAL PROCEDURE ,

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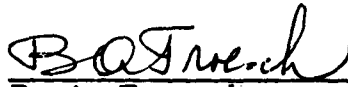
COMMANDER SPACE SYSTEMS DIVISION
UNITED STATES AIR FORCE
Inglewood, California

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AERODYNAMIC INFLUENCE COEFFICIENTS FROM
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AND COMPUTATIONAL PROCEDURE

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ABSTRACT

~~In this report, we~~ ^A review ^{is made of} a method for computing the aerodynamic influence coefficients (AICs) for surfaces with supersonic leading edges. The method is based on the two-dimensional second-order potential solution of Van Dyke. The strip oscillatory coefficients are obtained from the extension of Van Dyke's work by Rodden and Revell to include the effects of sweep and finite span in addition to the effects of thickness, leading to a method that will avoid the unconservatism of linearized theory and will be applicable at Mach numbers below the lower Mach number limit of piston theory.

The influence coefficients relate the aerodynamic forces to the surface deflections through the following definitions. In the oscillatory case,

$$\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$$

and in the steady case,

$$\{F_s\} = (1/2) \rho V^2 (S/\bar{c}) [C_{hs}] \{h\}$$

The Aerospace IBM 7090 Computer Program No. HM10 provides the AICs in printed and optional punched-card output formats. The theoretical formulation is limited to Mach numbers normal to the leading edge greater than 1.25. The program capacity is 25 surface strips, 25 values of Mach number, and 50 values of reduced velocity.

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SYMBOLS

A_n, B_n, C_n, D_n	Coefficients in series expansion for oscillatory aerodynamic coefficients
a_{ij}	Coefficients in series expansion of pressure coefficients
b	Local semichord
b_r	Reference semichord
C_h	Element of oscillatory aerodynamic influence coefficient matrix
C_{hs}	Element of steady aerodynamic influence coefficient matrix
c	Local chord
\bar{c}	Mean aerodynamic chord
c_r	Root chord
c_t	Tip chord
d	Distance between forward and aft control points
F	Control point force
f_n	Finite span correction factors
g	Airfoil semithickness
h	Vertical deflection
I_n, J_n, K_n, L_n	Thickness integrals
k	Local reduced frequency, $k = \omega b/V$
k_r	Reference reduced frequency
L_{h_o}, L_{a_o}	Oscillatory leading edge lift coefficients
L_o	Lift referred to leading edge motion
M	Freestream Mach number

\bar{M}	Normal Mach number, $\bar{M} = M \cos \Lambda$
M_{h_o}, M_{a_o}	Oscillatory leading edge moment coefficients
M_o	Moment about leading edge
N	$= [(\gamma+1)/2] (M/\beta)^2$
\bar{N}	$= [(\gamma+1)/2] (\bar{M}/\bar{\beta})^2$
r	$= \tau_{te}/\tau$
S	Wing area
s	Wing semispan
V	Free stream velocity
$V/b_r \omega$	Reference reduced velocity, $V/b_r \omega = 1/k_r$
x, ξ	Streamwise coordinates
x_m	Chordwise location of point of maximum thickness
α	Angle of attack
β	$= (M^2 - 1)^{1/2}$
$\bar{\beta}$	$= (\bar{M}^2 - 1)^{1/2}$
γ	Specific heat ratio of air ($\gamma = 1.400$)
Δy	Strip width
Λ	Leading edge sweep angle
λ	Trailing edge sweep angle
ρ	Free stream density
τ	Airfoil maximum thickness ratio
τ_{te}	Airfoil trailing edge thickness ratio
ω	Circular frequency
$[\]$	Square matrix
$\{ \}$	Column matrix

SECTION I

FORMULATION OF PROBLEM

A. Introduction

For aeroelastic analyses of surfaces with supersonic leading edges, a strip theory is desirable that will avoid the unconservatism of linearized theory and will be applicable at lower Mach numbers than piston theory. The second-order theory of Van Dyke¹ offers such a possibility, and it can be shown² that both the linearized theory and the piston theory are special cases of this solution.

Van Dyke's analysis is the result of both an iteration and a frequency expansion in the solution of the nonlinear, unsteady potential equation. The iteration has been carried through to obtain the second-order velocity potential (first-order in thickness), and the frequency expansion has been extended to the cubic term. The result has been presented in a series form for the local pressure coefficient on the airfoil; no control surface has been considered.

The present formulation makes use of the pressure coefficient as integrated by Rodden and Revell,² corrected for sweep and finite span. The AICs for strip theory have been discussed in Ref. 3 considering quarter-chord coefficients; a more convenient derivation utilizing leading edge coefficients is given in the present study. The computational aspects of this report are an extension of work previously discussed in Ref. 4.

B. Sign Convention

The flutter sign convention is used in the oscillatory case: forces and deflections are positive down; rotations are positive with leading edge up. The aerodynamic sign convention is used in the steady case: forces and deflections are positive up, rotations are positive with leading edge up.

C. Derivation of Equations

The derivation is based on the defining equation for the matrix of oscillatory AICs

$$\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$$

The steady AICs are defined by

$$\{F_s\} = (1/2) \rho V^2 (S/\bar{c}) [C_{hs}] \{h\}$$

and will be obtained from the limit of the oscillatory case

$$[C_{hs}] = \lim_{k_r \rightarrow 0} 2k_r^2 (s\bar{c}/S) [C_h]$$

We shall derive the aerodynamic matrix for only a single strip since strip theory leads to a partitioned form for the entire surface; e. g. ,

$$[C_h] = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & C_{h1} & 0 & 0 \\ 0 & 0 & C_{h2} & 0 \\ 0 & 0 & 0 & C_{h3} \end{bmatrix}$$

in the case of a three-strip wing where the first null partition is reserved for control points whose aerodynamic forces can be neglected (e. g. , external stores). Each surface partition is of the order 2 x 2 since we consider only

the degrees of freedom in pitching and plunging: the Van Dyke solution has not yet been extended to the control surface degree of freedom. The given and equivalent force systems and geometry are shown in Fig. 1. The forward control point in the equivalent system has been arbitrarily placed in the quarter chord location.

The force equivalence is given by

$$\begin{bmatrix} 1 & 1 \\ b/2 & (d+b/2) \end{bmatrix} \begin{Bmatrix} F_1 \\ F_2 \end{Bmatrix} = \begin{Bmatrix} L_o \\ M_o \end{Bmatrix}$$

from which

$$\begin{Bmatrix} F_1 \\ F_2 \end{Bmatrix} = \begin{bmatrix} (1+b/2d) & -1/d \\ -b/2d & 1/d \end{bmatrix} \begin{Bmatrix} L_o \\ M_o \end{Bmatrix}$$

The leading edge oscillatory coefficients are defined by

$$\begin{Bmatrix} L_o \\ M_o \end{Bmatrix} = 4\rho\omega^2 b^2 \Delta y \begin{bmatrix} 1 & 0 \\ 0 & b \end{bmatrix} \begin{bmatrix} L_{h_o} & L_{a_o} \\ M_{h_o} & M_{a_o} \end{bmatrix} \begin{Bmatrix} h_o \\ b_a \end{Bmatrix}$$

The geometrical equivalence is

$$\begin{Bmatrix} h_o \\ b_a \end{Bmatrix} = \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix} \begin{Bmatrix} h_1 \\ h_2 \end{Bmatrix}$$

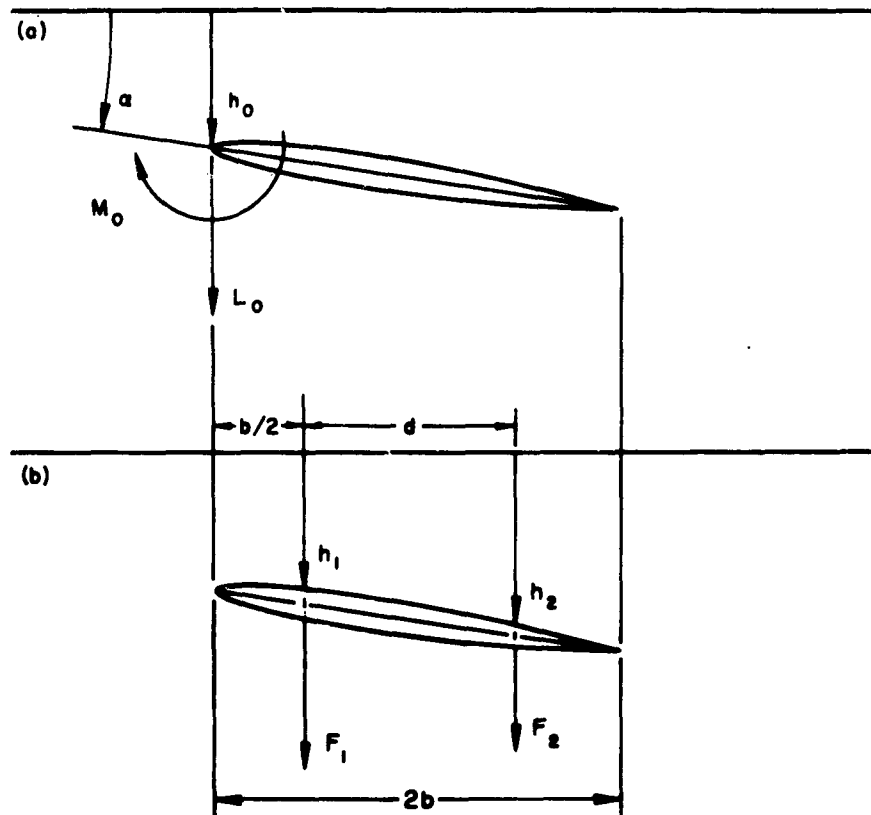


Fig. 1. Original (a) and Equivalent (b) Force Systems and Geometry.

Cascading the above solutions we find

$$\begin{Bmatrix} F_1 \\ F_2 \end{Bmatrix} = 4\rho\omega^2 b^2 \Delta y \begin{bmatrix} (1+b/2d) & -b/d \\ -b/2d & b/d \end{bmatrix}$$

$$\times \begin{bmatrix} L_{h_o} & L_{a_o} \\ M_{h_o} & M_{a_o} \end{bmatrix} \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix} \begin{Bmatrix} h_1 \\ h_2 \end{Bmatrix}$$

Comparing this result to the definition of the influence coefficient matrix, we find

$$[C_h] = 4(b/b_r)^2 (\Delta y/s) \begin{bmatrix} (1+b/2d) & -b/d \\ -b/2d & b/d \end{bmatrix}$$

$$\times \begin{bmatrix} L_{h_o} & L_{a_o} \\ M_{h_o} & M_{a_o} \end{bmatrix} \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix}$$

We note the pre- and post-multipliers to be mutual transposes. Once the partitions have been obtained for each strip, the total matrix is formed as indicated above.

The steady influence coefficients follow as a limiting case of the oscillatory matrix. From the definitions of both oscillatory and steady matrices we find (since in both sign conventions the forces and deflections are in the same direction)

$$[C_{hs}] = \lim_{k_r \rightarrow 0} 2k_r^2 (s\bar{c}/S) [C_h]$$

We next consider the oscillatory coefficients necessary in the influence coefficient formulation. Space permits only a summary of the results given by Ref. 2. The strip leading edge oscillatory coefficients are given by

$$L_{h_o} = A_2 f_2 + i(A_3 f_1 / k + A_4 f_3 k)$$

$$L_{a_o} = (B_1 f_1 / k^2 + B_2 f_3) + i(B_3 f_2 / k + B_4 f_4 k)$$

$$M_{h_o} = C_2 f_3 + i(C_3 f_2 / k + C_4 f_4 k)$$

$$M_{a_o} = (D_1 f_2 / k^2 + D_2 f_4) + i(D_3 f_3 / k + D_4 f_5 k)$$

where A_n , B_n , C_n , and D_n depend on the Mach number and airfoil thickness integrals, the f_n are finite span correction factors, and the reduced frequency k is based on the local chord.

The basic expressions involved in A_n , B_n , C_n , and D_n can be outlined, but the reader is referred to Ref. 2 for the finite span correction factors f_n (it may be noted that the $f_n = 1$ for all strips inboard of the tip Mach cone, whereas the $f_n < 1$ in the region of the tip Mach cone). The basic expressions are

$$A_2 = -(1/8) (a_{22}/2 + J_1 a_{24} + I_2 a_{26})$$

$$A_3 = -(1/8) (a_{12} + I_1 a_{14})$$

$$A_4 = -(1/8) (a_{32}/3 + K_1 a_{34} + J_2 a_{36} + I_3 a_{38})$$

$$B_1 = (1/4) (a_{01} + I_1 a_{02})$$

$$B_2 = (1/4) (a_{21}/3 + K_1 a_{23} + J_2 a_{25} + I_3 a_{27})$$

$$B_3 = (1/4) (a_{11}/2 + J_1 a_{13} + I_2 a_{15})$$

$$B_4 = (1/4) (a_{31}/4 + L_1 a_{33} + K_2 a_{35} + J_3 a_{37} + I_4 a_{39})$$

$$C_2 = -(1/4) (a_{22}/3 + J_2 a_{24} + I_3 a_{26})$$

$$C_3 = -(1/4) (a_{12}/2 + I_2 a_{14})$$

$$C_4 = -(1/4) (a_{32}/4 + K_2 a_{34} + J_3 a_{36} + I_4 a_{38})$$

$$D_1 = (1/2) (a_{01}/2 + I_2 a_{02})$$

$$D_2 = (1/2) (a_{21}/4 + K_2 a_{23} + J_3 a_{25} + I_4 a_{27})$$

$$D_3 = (1/2) (a_{11}/3 + J_2 a_{13} + I_3 a_{15})$$

$$D_4 = (1/2) (a_{31}/5 + L_2 a_{33} + K_3 a_{35} + J_4 a_{37} + I_5 a_{39})$$

where

$$a_{01} = - (4/\bar{\beta}) \cos \Lambda$$

$$a_{02} = - (4/\bar{\beta}^2) (\bar{M}^2 \bar{N} - 2)$$

$$a_{11} = (8/\bar{\beta}^3) (2 - \bar{M}^2) \cos \Lambda$$

$$a_{12} = (8/\bar{\beta}) \cos \Lambda$$

$$a_{13} = (16\bar{M}^2/\bar{\beta}^4) (\bar{N} - 1)$$

$$a_{14} = (8/\bar{\beta}^2) (\bar{M}^2 \bar{N} - 2)$$

$$a_{15} = (8/\bar{\beta}^4) (2 - \bar{M}^2) (\bar{M}^2 \bar{N} - 1)$$

$$a_{21} = (4/\bar{\beta}^5) (\bar{M}^2 + 2) \cos \Lambda$$

$$a_{22} = (16/\bar{\beta}^3) \cos \Lambda$$

$$a_{23} = (8\bar{M}^2/\bar{\beta}^6) [3 (3\bar{M}^2 - 2) \bar{N} - 2 (5\bar{M}^2 - 3)]$$

$$a_{24} = (8\bar{M}^2/\bar{\beta}^4) (4\bar{N} - 5)$$

$$a_{25} = (4\bar{M}^2/\bar{\beta}^6) [(16 - 7\bar{M}^2) \bar{N} + 4 (2\bar{M}^2 - 3)]$$

$$a_{26} = (16\bar{M}^2/\bar{\beta}^4) (\bar{N} - 1)$$

$$a_{27} = (4\bar{M}^2/\bar{\beta}^6) [(\bar{M}^2 + 2) \bar{N} - 4]$$

$$a_{31} = - (8\bar{M}^2/3\bar{\beta}^7) (\bar{M}^2 + 4) \cos \Lambda$$

$$a_{32} = - (24\bar{M}^2/\bar{\beta}^5) \cos \Lambda$$

$$a_{33} = (16\bar{M}^2/\bar{\beta}^8) [(17\bar{M}^4 - 10\bar{M}^2 - 4) \bar{N} - (5\bar{M}^2 - 2) (4\bar{M}^2 - 1)]$$

$$a_{34} = (16\bar{M}^2/\bar{\beta}^6) [6\bar{M}^2 - (5\bar{M}^2 - 2) \bar{N}]$$

$$a_{35} = (16\bar{M}^2/\bar{\beta}^8) [7\bar{M}^2 (2\bar{M}^2 - 1) - (12\bar{M}^4 - 3\bar{M}^2 - 4) \bar{N}]$$

$$a_{36} = (8\bar{M}^2/\bar{\beta}^6) [2(\bar{M}^2 + 1) - (\bar{M}^2 + 8) \bar{N}]$$

$$a_{37} = (8\bar{M}^2/\bar{\beta}^8) [(3\bar{M}^2 + 2) - (3\bar{M}^2 + 4) \bar{N}]$$

$$a_{38} = (8\bar{M}^2/\bar{\beta}^6) [2(\bar{M}^2 + 1) - 3\bar{M}^2\bar{N}]$$

$$a_{39} = (8\bar{M}^2/3\bar{\beta}^8) [(5\bar{M}^2 + 2) - \bar{M}^2\bar{N} (\bar{M}^2 + 4)]$$

and the thickness integrals are defined by

$$I_n = (1/2b)^n \int_0^{2b} x^{n-1} g' dx, \quad n = 1(1)5$$

$$J_n = (1/2b)^{n+1} \int_0^{2b} x^{n-1} g dx, \quad n = 1(1)4$$

$$K_n = (1/2b)^{n+2} \int_0^{2b} x^{n-1} dx \int_0^x g d\xi, \quad n = 1(1)3$$

$$L_n = (1/2b)^{n+3} \int_0^{2b} x^{n-1} dx \int_0^x \xi g d\xi, \quad n = 1(1)2$$

Reference 2 evaluates these thickness integrals for a typical airfoil.

From the oscillatory coefficient expressions we may find the limiting values and the steady matrix for a single strip

$$[C_{hs}] = 8(s\bar{c}/S) (\Delta y/s) \begin{bmatrix} (1+b/2d) & -b/d \\ -b/2d & b/d \end{bmatrix} \\ \times \begin{bmatrix} 0 & B_1 f_1 \\ 0 & D_1 f_2 \end{bmatrix} \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix}$$

D. References

1. M. D. Van Dyke. "Supersonic Flow Past Oscillating Airfoils Including Nonlinear Thickness Effects." NACA TN 2982, 1953.
2. W. P. Rodden and J. D. Revell. "Oscillatory Aerodynamic Coefficients for a Unified Supersonic Hypersonic Strip Theory." Journal of the Aerospace Sciences, 27 (1960), 451; based on North American Aviation, Inc., Report NA-57-1549, 31 December 1957.

3. W. P. Rodden. "Aerodynamic Influence Coefficients from Strip Theory." Journal of the Aerospace Sciences, 26 (1959), 833.

4. W. P. Rodden, E. F. Farkas, and R. K. Oyama. "Aerodynamic Influence Coefficients by Supersonic Strip Theory: Analytical Development and Procedure for the IBM 7090 Computer." Norair Division, Northrop Corporation, Report NOR-61-56, 14 April 1961.

SECTION II

GENERAL DESCRIPTION OF INPUT

A. Units

Since all dimensional input is geometrical and the aerodynamic matrix is dimensionless, only a consistent set of length units is necessary: inches or feet.

B. Classes of Numerical Data and Limitations

The data required by the program are the geometry, reduced velocities, and Mach numbers. The example illustrates their use.

1. Example Problem

We consider the four-strip wing shown in Fig. 2 at the freestream Mach numbers of 1.8 and 2.5 for the reduced velocities of 4.0 and 8.0 and the steady case. The aerodynamic matrices will be found with and without the tip correction, and the thickness integrals will be generated by the program from the expressions of App. A of Ref. 2 for an assumed airfoil (constant across the span) having 10 percent thickness, maximum thickness at 40 percent chord, and a blunt trailing edge that has a trailing-edge-to-maximum-thickness ratio of 0.15.

2. Program Restrictions and Options

- a. The number of strips into which a wing may be subdivided must be ≤ 25 .
- b. The number of reduced velocities used for any one Mach number must be ≤ 50 .
- c. The number of values of Mach number must be ≤ 25 .
- d. If it is desired to compute the steady matrix $[C_{hs}]$, a zero or negative value of $V/b_r \omega$ must be used and S and \bar{c} must also be supplied.

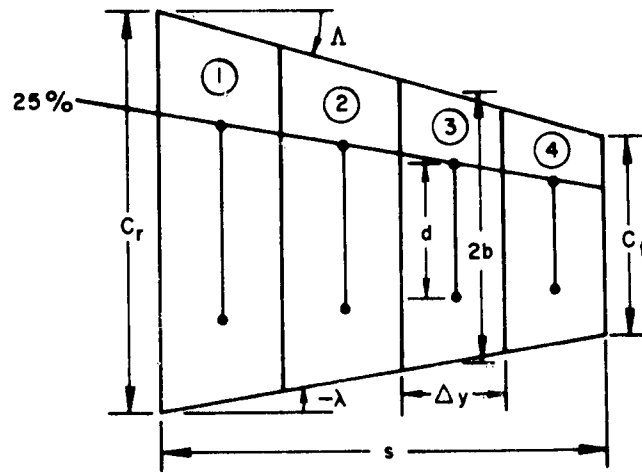


Fig. 2. Example of Four-Strip Wing.

Strip No.	Δy (ft)	b (ft)	d (ft)
1	4.7	12.28125	11.9
2	4.2	9.50000	9.0
3	3.6	7.06250	6.6
4	3.1	4.96875	4.5

$$b_r = 6.5 \text{ ft}$$

$$s = 15.6 \text{ ft}$$

$$c_r = 27.5 \text{ ft}$$

$$c_t = 8.0 \text{ ft}$$

$$\tan \Lambda = 0.75 \text{ (} \cos \Lambda = 0.80 \text{)}$$

$$\tan \lambda = -0.50$$

$$\bar{c} = 21.0 \text{ ft}$$

$$S = 554.0 \text{ sq ft}$$

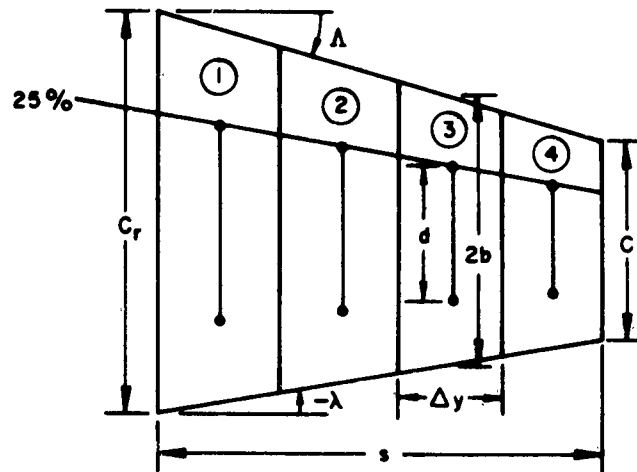


Fig. 2. Example of Four-Strip Wing.

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$$\tan \lambda = -0.50$$

$$\bar{c} = 21.0 \text{ ft}$$

$$S = 554.0 \text{ sq ft}$$

SECTION III
DATA DECK SETUP

A. Loading Order

Input decks punched from keypunch forms are loaded behind column binary deck HM10. Any number of complete decks may be stacked. The data for each deck must be in the following order:

- (1) Heading Card 1
- (2) Heading Card 2
- (3) ISTRIP, JMACH, KVBRW, ISTHK, ISTIP, NO PUNJ
- (4) b_r , s , S , \bar{c} , c_t , $\tan \Lambda$, $\tan \lambda$, $\cos \Lambda$
- (5) b_i series
- (6) d_i series
- (7) Δy_i series
- (8) M_j series
- (9) $(V/b_r \omega)_k$ series
- (10) Thickness integrals
 - (a) Provide thickness integrals
 - (b) Input data to compute thickness integrals

B. Input Data Description

- (1) Heading Card 1 may contain any information desired (Columns 2 through 72). Column 1 should be blank.
- (2) Heading Card 2 provides for more information (Columns 2 through 72): vehicle, date, name. Column 1 is blank and all or any of the fields may be blank but the card must be included.

(3) Control card (FORMAT 1814)

- (a) ISTRIP = number of strips
- (b) JMACH = number of Mach numbers
- (c) KVBRW = number of reduced velocities
- (d) ISTHK = 0 if thickness integrals are tabulated
= 1 if x_m/c , τ , and r are constant
= 2 if x_m/c and r are constant and τ varies with each strip
= 3 if x_m/c , τ , and r all vary with each strip
- (e) ISTIP = 0 if tip correction factor is 1.0
≠ 0 if tip correction factor is to be computed by program
- (f) NO PUNJ = 0 or blank if the computed matrices are to be punched in cards
≠ 0 if no punched cards are desired

(4) Single parameters (FORMAT 6E12.8): When computing both steady-state and oscillatory AICs from the same data deck, we use the eight parameters: b_r (semichord), s (semispan), S (surface area), \bar{c} (mean aerodynamic chord), c_t (tip chord), $\tan \Lambda$ (tangent of leading edge sweep angle), $\tan \lambda$ (tangent of trailing edge sweep angle), and $\cos \Lambda$ (cosine of leading edge sweep angle). For computing oscillatory cases, S and \bar{c} may be blank (or included); and for steady cases, b_r and s may be blank (or included). These parameters are tabulated in the same order as defined, and always require two lines (cards).

(5), (6), and (7) Series b_i , d_i , and Δy_i (FORMAT 6E12.8): The number of lines (cards) required by the b_i , d_i , and Δy_i series is controlled by the number of strips. Using the maximum 25 strips would require five cards for each series. Tabulate b_i (local semichords), d_i (distance between control points), and

Δy_i (strip widths) in the order defined with each new series starting on a new card.

- (8) and (9) M_j (freestream Mach number) and $V/b_r \omega$ (reduced velocity) series (FORMAT 6E12.8): The M_j series may be input in any order desired with $j \leq 25$ per deck. $M_j \cos \Lambda$ must be ≥ 1.25 . The $(V/b_r \omega)_k$ series is tabulated only once per deck and will be repeated by the program for each Mach number indicated by the M_j series. For the steady case, tabulate either a zero or negative $V/b_r \omega$.

(10) Thickness integral input (FORMAT 6E12.8)

- (a) $ISTHK = 0$; the thickness integrals must be tabulated in the order: $I_1, I_2, I_3, I_4, I_5, J_1, J_2, J_3, J_4, K_1, K_2, K_3, L_1$, and L_2 (three cards).

- (b) $ISTHK \neq 0$; the thickness integrals are computed by supplying x_m/c (percent chord location of maximum thickness), τ (airfoil maximum thickness ratio), and r (ratio of τ_{te}/τ).
When using this option omit (10. a).

- 1) $ISTHK = 1$; the three ratios are each constant for the surface and tabulated in the order defined. (First field in three separate cards.)

- 2) $ISTHK = 2$; the ratios x_m/c and r are each constant for the surface but τ varies with each strip. Input in the order x_m/c , (Field 1, first thickness integral card), τ series (beginning on a new card), and r (Field 1 of the last card).

- 3) ISTHK = 3; the ratios x_m/c , τ , and r all vary with each strip. Tabulate in order with each new series starting on a new card.

C. Example Keypunch Forms

Example keypunch forms are given on the following pages. Columns 73 through 80 are reserved for data deck identification. This space may be used in any fashion; however, it is suggested that the last three columns be used for sequencing. Only the cards with sequencing in Columns 73 through 80 are to be used in the sample data deck; the lines (cards) with Columns 73 through 80 blank are for clarification of input.

80 COLUMN FREE KEYPUNCH



AEROSPACE CORPORATION

PROGRAMMER _____ KEY PUNCHED _____ DATE _____ SHEET _____

Variable	Value	Value	Value
d_1	+0119	+011466	+01100007
d_7			
d_{13}			
d_{19}			
d_{25}			
ENTER CHORDWISE DISTANCE BETWEEN CONTROL POINTS (d _i)			
Δy_1	+01142	+01136	+01100008
Δy_7			
Δy_{13}			
Δy_{19}			
Δy_{25}			
ENTER STRIP WIDTH (Δy _i)			
M_1	+01125	+01100009	
M_7			
M_{13}			
M_{19}			
M_{25}			
MACH NUMBERS (M _i)			

80 COLUMN FREE KEYPUNCH



AEROSPACE CORPORATION

SECTION		SERIAL		DATE		TIME	
SAMPLE CASE		WITH TIP CORRECTION		N P R D D E N		HMICACCI	
4	5	1	1	1	1	02	03
1.5	+0.1+1.56	+0.2+5.54	+0.3+2.1	+0.28	10.1-7.5	+0.0	04
-5	+0.0+8	+0.0					05
b ₁ - 2.8125	+0.2+9.1	+0.1+7.0625	+0.1+4.96875	+0.1			06
d ₁ - 4	+0.2+9	+0.1+6.6	+0.1+4.5	+0.1			07
Δ ₁ - 4.7	+0.1+4.2	+0.1+3.6	+0.1+3.1	+0.1			08
Δ ₂ - 8	+0.1+7.4	+0.1					09
Δ ₃ - 4	+0.1+4	+0.1+0	+0.2				10
Δ ₄ - 4	+0.1+4	+0.1+0					11
Δ ₅ - 4	+0.1+4	+0.1+0					12
Δ ₆ - 4	+0.1+4	+0.1+0					13

SECTION IV
PROGRAM OUTPUT

A. Printed Output

1. All input data.
2. Each group of AICs with the associated Mach number and $V/b_r \omega$.
3. Sequencing number of the first and last punched cards (output) for each group (one $V/b_r \omega$) of influence coefficients.
4. Example problem printed output is given on the following pages.

ACROUSTIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

INPUT DATA

4 STRIPS
2 MACH NUMBERS
3 REDUCED FREQUENCIES

COSINE LAMBDA = 0.8000000E 00
B(R) = 0.64999999E 01
S = 0.1500000E 02
S = 0.5540000E 03
CNR = 0.2000000E 02
C(T) = 0.8000000E 01
TAN LD = 0.7500000E 00
TAN TR = -0.5000000E 00

WITHOUT TIP CORRECTION

DELTA Y (I)	B(I)	D(I)
0.4699999E 01	0.12281249E 02	0.11900000E 02
0.4199999E 01	0.9500000E 01	0.8000000E 01
0.3599999E 01	0.10675000E 01	0.6599999E 01
0.3099999E 01	0.73607500E 01	0.4500000E 01

1/K (R) = 0.4000000E 01 0.8000000E 01 0.

XR/C = 0.4000000E-00

YAU = 0.0999999E-00

R = 0.1500000E-00

FINITE DIFFERENCE INTEGRALS

II(I)	I2(I)	I3(I)	I4(I)	I5(I)	J1(K)	J2(K)
0.7499999E-02	-0.2733333E-01	-0.2671665E-01	-0.2341199E-01	-0.2040986E-01	0.3483333E-01	0.1710833E-01
J3(K)	J4(K)	K1(K)	K2(K)	K3(K)	L1(K)	L2(K)
0.3099999E-01	0.0077777E-02	0.1772499E-01	0.1226466E-01	0.9285288E-02	0.6804330E-02	0.5065433E-02

AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE

1/K(R) = 0.4000000E 01

M = 0.1799999E 01

NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.82001874E 01	-0.85972560E 01	-0.94911763E 01	0.40570676E 01
-0.58696458E 01	0.73110541E 01	0.34727361E 01	-0.60698704E 01

CHI 2) SIZE = 2 BY 2

0.85667374E 01	-0.8160885E 01	-0.92178287E 01	0.28994517E 01
-0.14538863E 01	0.18207212E 01	0.14304339E-00	-0.19185340E 01

CHI 3) SIZE = 2 BY 2

0.70664008E 01	-0.39633985E 01	-0.82997753E 01	0.18964119E 01
0.10966189E 01	-0.30490182E-001	-0.10857527E 01	-0.17815797E-001

CHI 4) SIZE = 2 BY 2

0.72746900E 01	-0.24152532E 01	-0.73959825E 01	0.11276747E 01
0.24201058E 01	-0.78480651E 001	-0.25969680E 01	0.31905624E-001

ROUTED CARDS NOS. 11115 0 THRU 11110 8

TELETYPE UNIT

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

CH(1) SIZE = 2 BY 2

0.41085899E 02 -0.17848561E 02I -0.42376889E 02 0.80526985E 01I
0.85083166E 01 -0.32902742E 01I -0.10905226E 02 0.62052464E 00I

0.11986747E 02 -0.40591970E 01I -0.13297591E 02 0.16840269E 01I

CH(3) SIZE = 2 BY 2

CH(4) SIZE = 2 BY 2

0.29772104E 02 -0.48014827E 01I -0.29893397E 02 0.22108020E 01I
0.13175341E 02 -0.24483751E 01I -0.13452203E 02 0.12761046E 01I

STEADY CASE

1/K(R) = 0.

CH(1) SIZE = 2 BY 2
0.81027073E 00 -0.81027073E 00
0.35425846E-00 -0.35425848E-00

0.33116364E-00 -0.33116364E-00

CH(3) SIZE = 2 BY 2

CH(4) SIZE = 2 BY 2
0.55431357E 00 -0.55431357E 00.
0.26746202E-00 -0.26746202E-00

5 AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE
1/K(R) = 0.4000000E 01
M = 0.24999999E 01
NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2
0.61223587E 01 -0.39058710E 01 -0.62933354E 01 0.99004493E 001
0.15446437E 01 0.31125329E-001 -0.20665466E 01 -0.12606335E 011

CHI 2) SIZE = 2 BY 2
0.56652314E 01 -0.27185035E 011 0.57505243E 01 0.71339553E 001
0.19906042E 01 -0.44966330E-011 -0.22760270E 01 -0.74438580E 001

CHI 3) SIZE = 2 BY 2
0.49822141E 01 -0.17355043E 011 -0.49906550E 01 0.46350733E-001
0.206399120E 01 -0.16625692E-001 -0.22060827E 01 -0.51651168E-001

CHI 4) SIZE = 2 BY 2
0.43656130E 01 -0.10551950E 011 -0.43801361E 01 0.29555888E-001
0.20787904E 01 -0.13237961E-001 -0.21390743E 01 -0.23801012E-001

PUNCHED CARDS NOS. MM10 24 THRU MM10 32

ACCOUSTIC INFLUENCE COEFFICIENTS BY SUPER-SONIC STIMP THEORY

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

1 = 0.24999999E 01

NUMBER OF STIMPS = 4

CHI 1) SIZE = 2 BY 2

0.25403119E 02 -0.78336976E 011 -0.25574115E 02 0.19634566E 011
0.10494554E 02 -0.86506670E 001 -0.11016458E 02 -0.16577762E 011

CHI 2) SIZE = 2 BY 2

0.23111115E 02 -0.54317791E 011 -0.23111115E 02 0.14114305E 011
0.10357052E 02 -0.72755752E 001 -0.10642475E 02 -0.11151575E 011

CHI 3) SIZE = 2 BY 2

0.20402744E 02 -0.34657603E 011 -0.20402744E 02 0.91949302E 001
0.83200000E 01 -0.32197290E 001 -0.32197290E 01 -0.69386080E 001

CHI 4) SIZE = 2 BY 2

0.17530102E 02 -0.21065729E 011 -0.17544626E 02 0.58752020E 001
0.88358944E 01 -0.33709711E-001 -0.88961783E 01 -0.43284714E-001

FINISHED FIELDS NOS. 0010 33 FINISH 41

7
AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

STEADY CASE

1/K(R) = 0.

M = 0.24333091 01
NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 2) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.20614082E-00 -0.20614082E-00

CHI 3) SIZE = 2 BY 2

0.32435972E-00 -0.32435972E-00
0.16648821E-00 -0.16648821E-00

CHI 4) SIZE = 2 BY 2

0.32435972E-00 -0.32435972E-00
0.16648821E-00 -0.16648821E-00

PUNCHED CARDS NO.1. NM10 42 THRU NM10 47

ALGORITHMIC INFLUENCE COEFFICIENTS BY SUPERSONIC SHIP THEORY

INPUT DATA

1. SHIP
2. SHIP NUMBER
3. SELECTED FREQUENCIES

COSINE LAMBDA = 0.80000000E 00
B(R) = 0.64999999E 01
C(T) = 0.80000000E 01
TAN LD = 0.75000000E 00
TAN TR = -0.50000000E 00

SHIP TIP CORRECTION

DELTA Y (I)	B(I)	D(I)
0.46999999E 01	0.12281249E 02	0.11900000E 02
0.51999999E 01	0.95000000E 01	0.89999999E 01
0.56999999E 01	0.70625000E 01	0.73999999E 01
0.61999999E 01	0.46875000E 01	0.45000000E 01

1/K (R) = 0.40000000E 01 0.80000000E 01 0.

SH/C = 0.40000000E 00
SH = 0.40000000E 00

R = 0.15000000E 00

COEFFICIENTS INTEGRALS

J3(K)	J2(K)	J1(K)	J4(K)	J5(K)	J6(K)	J7(K)	J8(K)	J9(K)	J10(K)	J11(K)	J12(K)
0.74999999E-02	-0.27333333E-01	-0.26716665E-01	-0.23411999E-01	-0.20409366E-01	0.34833333E-01	0.17108332E-01	0.17108332E-01	0.17108332E-01	0.17108332E-01	0.17108332E-01	0.17108332E-01
0.10000000E-01	0.80000000E-02	0.11726666E-01	0.17766666E-01	0.27766666E-01	0.38063333E-02	0.50654332E-02	0.50654332E-02	0.50654332E-02	0.50654332E-02	0.50654332E-02	0.50654332E-02

ACCELERATING INFLUENCE COEFFICIENTS BY SUPERSONIC SLIP THEORY

OSCILLATORY CASE

1/K(R) = 0.4000000E 01
N = 0.1799999E 01
NUMBER OF SLIPS = 4

CHI 1) SIZE = 2 BY 2

0.82001874E 01	-0.85972560E 01	-0.94911763E 01	0.40570676E 01
-0.58696458E 01	0.73110541E 01	0.34727361E 01	-0.60698704E 01
CHI 2) SIZE = 2 BY 2			
0.25000000E 01	-0.81057104E 01	-0.22154157E 01	0.28972358E 01
-0.14499702E 01	0.18151077E 01	0.14196405E-00	-0.19130098E 01

CHI 3) SIZE = 2 BY 2

0.10000000E 01	-0.31057104E 01	-0.81057104E 01	0.17002901E 01
0.00000000E 00	-0.27371000E-001	-0.14301600E 01	-0.13547597E-001

CHI 4) SIZE = 2 BY 2

0.60005280E 01	-0.19105424E 01	-0.60936828E 01	0.84950338E 001
0.68430612E 00	-0.25560378E-001	-0.81209405E 00	0.10747413E-001

UNRECORDED CARDS MOD. 10/10 ON TAPU H410 54

AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

M = 0.1799999E 01

NUMBER OF STRIPS = 4

CH(1) SIZE = 2 BY 2

0.41085899E 02 -0.17848561E 021 -0.42376889E 02 0.80526985E 011
0.85083166E 01 -0.32902742E 011 -0.10905226E 02 0.62052464E 001

CH(2) SIZE = 2 BY 2

0.38913001E 02 -0.12433063E 021 -0.38974453E 02 0.56485263E 011
0.11960503E 02 -0.40507598E 011 -0.13268510E 02 0.16807653E 011

CH(3) SIZE = 2 BY 2

0.33479501E 02 -0.78497550E 011 -0.33789770E 02 0.35371212E 011
0.10972031E 02 -0.28939713E 011 -0.11516255E 02 0.14693199E 011

CH(4) SIZE = 2 BY 2

0.24600406E 02 -0.38357250E 011 -0.246933561E 02 0.16956007E 011
0.45326774E 01 -0.91177386E 001 -0.46604652E 01 0.50467691E 001

PUNCHED CARDS NOS. MM10 57 THRU MM10 65

AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

STEADY CASE

1/K(R) = 0.

M = 0.1759599E 01
NUMBER OF STRIPS = 4

CH(1) SIZE = 2 BY 2

0.81027073E 00 -0.81027073E 00
0.35425846E-00 -0.35425848E-00

CH(2) SIZE = 2 BY 2

0.73322029E 00 -0.73322029E 00
0.33042052E-00 -0.33042052E-00

CH(3) SIZE = 2 BY 2

0.63104034E 00 -0.63104034E 00
0.24020923E-00 -0.24020923E-00

CH(4) SIZE = 2 BY 2

0.45828220E-00 -0.45828220E-00
0.94819973E-01 -0.94819972E-01

PUNCHED CARDS NOS. MM10 66 THRU MM10 71

OSCILLATORY CASE

1/K(R) = 0.4000000E 01
 R = 0.2000000E 01
 NUMBER OF STEPS = 4

CH(1) SIZE = 2 BY 2
 0.61223587E 01 -0.39058710E 01 0.62933545E 01 0.99004493E 001
 0.15446437E 01 0.31125329E-001 -0.20665466E 01 -0.12606335E 011

CH(2) SIZE = 2 BY 2
 0.19906042E 01 -0.44966330E-011 -0.22760270E 01 -0.74438580E 001
 0.61223587E 01 -0.39058710E 01 -0.27503243E 01 0.71339557E 001

CH(3) SIZE = 2 BY 2
 0.38625441E 01 -0.92699184E 001 -0.38768674E 01 0.25476145E-001
 0.10431063E 01 -0.32136280E-011 -0.10783541E 01 -0.15464710E-001

CH(4) SIZE = 2 BY 2
 0.38625441E 01 -0.92699184E 001 -0.38768674E 01 0.25476145E-001
 0.10431063E 01 -0.32136280E-011 -0.10783541E 01 -0.15464710E-001

UNMATCHED CAPSIDS MSGS: MSG10 12 INRU MSG10 80

ACOUSTIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

A = 0.2499999E 01

NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.25403119E 02 -0.78336976E 01 -0.25574115E 02 0.19634566E 01
0.10494554E 02 -0.86506670E 00 -0.11016458E 02 -0.16577762E 01

CHI 2) SIZE = 2 BY 2

0.23101005E 02 -0.34317257E 01 -0.23101005E 02 0.16114305E 01
0.10357052E 02 -0.72755752E 00 -0.10642475E 02 -0.11151575E 01

CHI 3) SIZE = 2 BY 2

0.20004375E 02 -0.34434337E 01 -0.20043153E 02 0.01635431E 00
0.03130550E 01 -0.51303730E 00 -0.00000296E 01 -0.68564665E 00

CHI 4) SIZE = 2 BY 2

0.15526666E 02 -0.18542319E 01 -0.15540989E 02 0.50872150E 00
0.44747236E 01 -0.10564039E-001 -0.4509715E 01 -0.28471817E-001

PUNCHED CARDS NOS. 1010 01 1010 01 1010 01 09

ACCELERATION INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

STEADY CASE

1/K(R) = 0.

N = 0.2499799E 01
NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 2) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 3) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 4) SIZE = 2 BY 2

0.28739219E-00 -0.28739219E-00
0.84551580E-01 -0.84551579E-01

PUNCHED CARDS NOS. MM10 90 THRU MM10 95

B. Punched Output

1. A deck of punched cards (output) from this program is suitable as an input deck to other programs requiring the use of AICs.
2. All punched output is sequenced in order on Columns 73 through 80 starting with HM100000. The data appear in the following order:
 - a. Card 1 contains $(V/b_r \omega)_1$ and M_1 (FORMAT 6E12.8).
 - b. Card 2 contains m , the size (number of control points) of the AIC matrix and n , the number of strips (partitions) FORMAT (18I4).
 - c. The AIC matrix punched in column binary form and its TRA card make up the remainder of the punched output for $(V/b_r \omega)_1$.
3. The order of statement (2) is repeated for all Mach numbers and reduced velocities per input deck.
4. Each matrix is punched in compact form by columns. Column 1 begins in origin 1 and Column 2 in location $(1 + \text{matrix size})$.
5. The oscillatory matrix is punched in the order: Column 1 (real), Column 1 (imaginary); Column 2 (real), Column 2 (imaginary); Column m (real), Column m (imaginary). In the steady case, all columns are real and are punched in order.

SECTION V
PROCESSING INFORMATION

A. Operation

STANDARD FORTRAN MONITOR system

B. Estimated Machine Time

T = time in minutes

ISTRIP = number of strips

JMACH = number of Mach numbers

KVBRW = number of reduced velocities

n = number of sets (decks) of input data

$$T = .5 + .03 \left[(ISTRIP \cdot JMACH \cdot KVBRW)_1 + (ISTRIP \cdot JMACH \cdot KVBRW)_2 \right. \\ \left. + \cdot + \cdot + (ISTRIP \cdot JMACH \cdot KVBRW)_n \right]$$

C. Machine Components Used

Core storage: 6772

Standard FORTRAN input tape (NTAPE 2)

Standard FORTRAN output print tape (NTAPE 3)

Standard FORTRAN punch tape (NTAPE 7)

SECTION VI
PROGRAM NOTES

A. Subroutines Used

RDLN: reads and prints title cards

AEROP3: punch AIC matrix

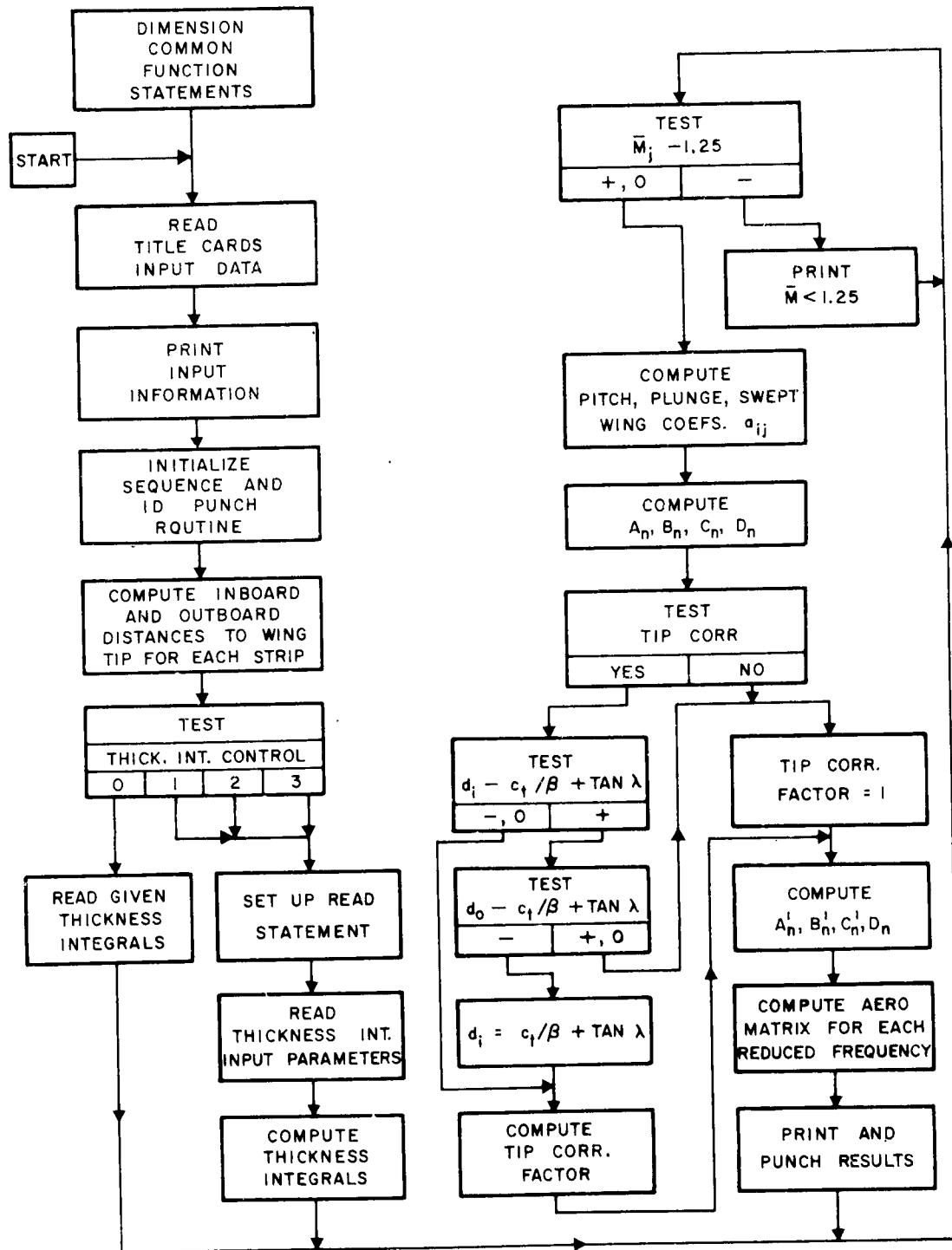
BINPU: column binary punch

All other subroutines used are on library tapes.

B. Generalized Tapes

Input, print, and punch tapes in this coding are defined as Units 2, 3, and 12 respectively; however, these may be altered by placing the desired units on symbolic cards HM100054, HM100055, and HM100056.

SECTION VII
FLOW DIAGRAM



SECTION VIII

SYMBOLIC LISTING

A partial list of the principal FORTRAN symbols used in the program may be related to the physical notation as follows:

<u>FORTRAN Notation</u>	<u>Physical Notation</u>
BI	b_i
DI	d_i
DELY	Δy
XMACHS	M_N
VBRW	$V/b_r \omega$
XMC	x_m/c
TAU	τ
AR	r
DISTO	d_o
DISTI	d_i
CHI	C_{h_i}
XLHO	L_{h_o}
XLAO	L_{a_o}
XMAO	M_{a_o}
XMHO	M_{h_o}
AI1, AI2, ..., AIN	I_1, I_2, \dots, I_n
AJ1, AJ2, ..., AJN	J_1, J_2, \dots, J_n
AK1, AK2, ..., AKN	K_1, K_2, \dots, K_n

SYMBOLIC LISTING (continued)

<u>FORTRAN Notation</u>	<u>Physical Notation</u>
AL1, AL2,...,ALN	L_1, L_2, \dots, L_n
B	β
BB1, BB2,...,BBN	B_1, B_2, \dots, B_n
C1, C2,...,CN	C_1, C_2, \dots, C_n
D1, D2,...,DN	D_1, D_2, \dots, D_n
FF1, FF2,...,FFN	f_1, f_2, \dots, f_n
ISTRIP	Number of strips
JMACH	Number of Mach numbers
KVBRW	Number of reduced frequencies
ISTHK	Thickness integral control
ISTIP	Tip correction control
NO PUNJ	Punch control
BR	b_r
SMS	s
CAPS	S
CBAR	\bar{c}
CT	c_t
TANLA	$\tan \Lambda$
TANLAM	$\tan \lambda$
COSLA	$\cos \Lambda$

The complete symbolic listing is given on the following pages.

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ALGEBRAIC INFLUENCE COEFFICIENTS 4/98/62

14 FORMAT (37H1 M BAR IS LESS THAN 1.25, M BAR = 1F6.3) HM100038
 15 FORMAT (1H0 47X, 18H OSCILLATORY CASE) HM100039
 16 FORMAT (1H0 49X, 18H STEADY CASE) HM100040
 17 FORMAT (1H 41X, 9H1/KIR) 1E16.8 / 1H 43X, 7H M 1E16.8 /HM100041
 18 FORMAT (1H 44X, 10HNUMBER OF SERIES = 1E3) HM100042
 19 FORMAT (1H0 44X, 3HCH1 1I2, 15H) SIZE = 2 BY 2) HM100043
 20 FORMAT (1H 36X, 2E17.8) HM100044
 21 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100045
 22 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100046
 23 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100047
 24 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100048
 25 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100049
 26 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100050
 27 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100051
 28 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100052
 29 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100053
 30 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100054
 31 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100055
 32 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100056
 33 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100057
 34 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100058
 35 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100059
 36 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100060
 37 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100061
 38 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100062
 39 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100063
 40 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100064
 41 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100065
 42 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100066
 43 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100067
 44 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100068
 45 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100069
 46 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100070
 47 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100071
 48 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100072
 49 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100073
 50 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100074
 51 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100075

LOGS(FIX)=LOG(FIX)
 SOME(CA,B,C,D,E,F)=DAG K /A*(B C*(D+E*F))

C NTAPE 2 = INPUT TAPE
 C NTAPE 3 = PRINT OUTPUT TAPE
 C NTAPE 7 = PUNCH OUTPUT TAPE
 NTAPE2 = 2
 NTAPE3 = 3
 NTAPE7 = 12

JTRD=2
 NCARDS=80
 GAMB=1.4

50 CALL RDLN (NTAPE2, NTAPE3, 1)
 CALL RDLN (NTAPE2, NTAPE3, 2)
 READ INPUT TAPE NTAPE2, 1, ISTRIP, JMACH, KVBW, ISTRK, ISTRIP, NOPUNJ HM100063
 READ INPUT TAPE NTAPE2, 2, BR, SMS, CAPS, CBAR, CT, TANLA, TANLAM, COSL HM100064
 READ INPUT TAPE NTAPE2, 2, (DEL(I), I=1, ISTRIP) HM100065
 READ INPUT TAPE NTAPE2, 2, (DEL(I), I=1, ISTRIP) HM100066
 READ INPUT TAPE NTAPE2, 2, (DEL(I), I=1, ISTRIP) HM100067
 READ INPUT TAPE NTAPE2, 2, (JMACHS(J), J=1, JMACH) HM100068
 READ INPUT TAPE NTAPE2, 2, (VBRW(K), K=1, KVBW) HM100069
 WRITE OUTPUT TAPE NTAPE3, 3 HM100070
 WRITE OUTPUT TAPE NTAPE3, 4, ISTRIP, JMACH, KVBW, COSL A, BR, SMS, HM100071
 CAPS, CBAR, CT, TANLA, TANLAM HM100072
 IF (ISTRIP) 51, 52, 51 HM100073
 51 WRITE OUTPUT TAPE NTAPE3, 5, HM100074
 GOTO. 53 HM100075

ACROBATIC INFLUENCE COEFFICIENTS 4/06/62

52 WRITE OUTPUT TAPE NTAPE3, 6,
53 WRITE OUTPUT TAPE NTAPE3, 7, (DELY(I),BT(I),DI(I),I=1,ISTRIP)

HM100076
HM100077
HM100078
HM100079
HM100080

ALONG=0
DO 54 I=1,ISTRIP
54 ALONG=DELY(I)+ALONG

HM100081
HM100082
HM100083

DIST(I)=ALONG
DISTO(I)=ALONG-DELY(I)
DO 55 I=2,ISTRIP

HM100084
HM100085
HM100086

DIST(I)=DISTO(I-1)
55 DISTO(I)=DISTO(I-1)-DELY(I)

HM100087
HM100088
HM100089
HM100090

ISTRIP=ISTRIP
DISTO(ISTRIP)=0
IF (ISTRK-1) 57,60,58
56 IF (ISTRK-2) 59,59,58

HM100091
HM100092
HM100093
HM100094

57 READ INPUT TAPE NTAPE2, 2, AI1(1),AI2(1),AI3(1),AI4(1),AI5(1),
AI6(1),AI7(1),AI8(1),AI9(1),AI10(1),AI11(1),AI12(1),
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70 WRITE OUTPUT TAPE NTAPE3, I4, EM

GOTO 106

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10-11-2018

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B3=B2*B

B4=B2*B2

B5=B2*B3

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VISUJEDLO 7-107

A01=-4.0/B*CO3LA
A02=-4.0/B2*(EM2*EN-2.0)

$$A11=8.0/83*(2.0-EM2)*COSLA$$
[illegible]

01-888-4444

Abstract: 070201 (H2024-7-0)

$$AI5=8.0/B4*(2.0-EM2)*(EM2*EN-L.)$$
$$A21=4.0/B5*(EM2+2.0)*COSLA$$

A22=16.0/B3*CSLA

[illegible]

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DIST04=DISt02*DISt02
DIST05=DISt02*DISt03
DIST06=DISt03*DISt03
DIST07=CT-DIST011*TANLAM
CT01=CT-DIST111*TANLAM
TANL4=TANL2*TANL2
CT4=CT2*CT2
CT5=CT3*CT2

IF (ABS(DIST111*(CT-TANLAM))- .25) 82,78,78
CONTINUE
79,80,79
R11=BETA/2.0*(-CT2/TANL2*LOGEF(CTD0/CTD1)+DISt02*LOGEF(CTD0
+DISt011*DISt011)-DISt12*LOGEF(CTD11/BETA*DISt11(1)))*CT/TANLAM+
2*DISt111-DIST011)
R12=BETA2*(1.0/BETA+1.0/TANLAM+DISt12-DIST02)*CT/TANL2
1*(DISt11-DIST011)-CT2/TANL3*LOGEF(CTD0/CTD1))
R13=BETA3/2.0*(.5*(DISt12-DIST02)*(1.0/TANL2-1.0/BETA2)+2.0/TANL3
+1*(CT*(DISt11-DIST011)-3.0/TANL4*CT2*LOGEF(CTD0/CTD1)+
2*CT3/TANL4*(1.0/CTD1-1.0/CTD0))
R22=DISt12/3.0*(DISt09*LOGEF(CTD2/BETA*DISt09(1))-DISt13
+LOGEF(CTD3/BETA*DISt11(1)))*CT/TANL3*LOGEF(CTD0/CTD1)
R23=BETA3*(-1.0/3.0*(DISt13-DIST03)*(1.0/BETA+1.0/TANLAM)-CT/(2.0+
TANL2)* (DISt12-DIST02)-CT2/TANL3*(DISt11-DIST011)+
2*CT3/TANL4*LOGEF(CTD0/CTD1))
R33=BETA3/4.0*(DISt09*LOGEF(CTD4/BETA*DISt09(1))-DISt14*LOGEF(
CTD1/BETA*DISt11(1))-CT4/TANL4*LOGEF(CTD0/CTD1)+CT/3.0*(DISt13-
DISt03))/TANLAM+CT2/(2.0*TANL2)*(DISt12-DIST02)+CT3/TANL3*(DISt11(1)
+3-DIST011))
GOTO 81

CONTINUE
R11=BETA/2.0*(-CT2/TANL2*LOGEF(CTD0/CTD1)-DISt12*LOGEF(CTD1/
+DISt011*DISt011)+CT/TANLAM*DISt11(1))
R12=BETA2*(.5*(DISt12-DIST02)*(1.0/BETA+1.0/TANLAM)+CT/TANL2*DISt11(1)
+1*(CT2/TANL3*LOGEF(CTD0/CTD1))

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PERODYNAMIC INFLUENCE COEFFICIENTS 4/06/62

R13=BETA3/2*(.5*DIST12*(1./TANL2-1./BETA2)+2./TANL3
1*CT*DIST11(I)-3./TANL4*CT2*LOGEF(CTDO/CTDI)+CT3/TANL4*

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81 CONTINUE

R10=.5*(2.*CT*(DIST11(I)-DISTO(I))-(DIST12-DISTO2)*(BETA+
TANLAM))

R20=1.0/6.0*(3.0*CT2*(DIST11(I)-DISTO(I))-3.0*CT1*TANLAM*(DIST12-
DISTO2)-(DIST13-DISTO3)*(BETA2-TANL2))

R21=BETA*(1.0/3.0*(DIST13-DISTO3)*(BETA+TANLAM)-.5*(DIST12
1-DISTO2)*CT)

R30=1.0/12.0*(4.0*CT3*(DIST11(I)-DISTO(I))-6.0*CT2*TANLAM*
1-DIST12-DISTO2)+.0*CT1*TANL2*(DIST13-DISTO3)-(DIST14-DISTO4)*

R31=BETA/2.0*(.25*(DIST14-DISTO4)*(BETA2-TANL2)+2.0/3.0*(DIST13
1-DISTO3)*CT1*TANLAM-.5*(DIST12-DISTO2)*CT2)

R32=BETA2*(-.25*(DIST14-DISTO4)*(BETA+TANLAM)+1.0/3.0*(DIST13
1-DISTO3)*CT)

R40=.05*(5.0*CT4*(DIST11(I)-DISTO(I))-10.0*CT3*TANLAM*(DIST12
1-DISTO2)+10.0*CT2*TANL2*(DIST13-DISTO3)-5.0*CT1*TANL3*
1-DIST14-DISTO4)-(DIST15-DISTO5)*(BETA4-TANL4))

R41=BETA/3.0*(.2*(DIST15-DISTO5)*(BETA3+TANL3)-.75*(DIST14
1-DISTO4)*CT1*TANL2+(DIST13-DISTO3)*CT2*TANLAM-.5*(DIST12
2-DISTO2)*CT3)

R42=BETA/2.0*(.2*(DIST15-DISTO5)*(BETA2-TANL2)-.5*(DIST14
1-DISTO4)*CT1*TANLAM+1.0/3.0*(DIST13-DISTO3)*CT2)

R43=BETA3*(-.2*(DIST15-DISTO5)*(BETA+TANLAM)-.25*
1-DIST14-DISTO4)*CT)

R50=1.0/30.0*(6.0*CT5*(DIST11(I)-DISTO(I))-15.0*CT4*TANLAM*
1-DIST12-DISTO2)+20.0*CT3*TANL2*(DIST13-DISTO3)-15.0*

Figure 1

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Figure 1

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

R33=.25*8BETA3*(DISTO4+LOGEF(CTO0/(BETA*DISTO(1)))-DISTI4*
 1LOGEF(CTDI/(BETA*DISTI(1)))-CT4*(.25*RAT4+TANLAM/5.0*RAT5+
 1TANL2/5.0*RAT6+TANL3/7.0*RAT7+TANL4/8.0*RAT8+TANL5/9.0*
 1TANL6/10.0*RAT9+TANL7/11.0*RAT10+TANL8/12.0*RAT11+
 1TANL9/13.0*RAT12))

GOTO 81

84 CONTINUE

R31=LOGEF(CT2*(1-DISTI2+LOGEF(CTDI/(BETA*DISTI(1)))-CT2*(1.5*
 1RAT2+TANL3/5.0*RAT4+TANL4/7.0*RAT5+TANL5/8.0*RAT6+TANL6/9.0*
 1RAT7+TANL7/10.0*RAT8+TANL8/11.0*RAT9+TANL9/12.0*RAT10+
 1TANL10/13.0*RAT11+TANL11/14.0*RAT12+TANL12/15.0*RAT13))

R12=BETA2*(.5/BETA*DISTI2-CT2*(1.73.0*RAT3+TANLAM/4.0*
 1RAT4+TANL2/5.0*RAT5+TANL3/6.0*RAT6+TANL4/7.0*RAT7+TANL5/
 1RAT8+TANL6/8.0*RAT9+TANL7/9.0*RAT10+TANL8/10.0*RAT11+
 1TANL9/11.0*RAT12+TANL10/12.0*RAT13+TANL11/13.0*RAT14+
 1TANL12/14.0*RAT15+TANL13/15.0*RAT16+TANL14/16.0*RAT17+
 1TANL15/17.0*RAT18+TANL16/18.0*RAT19+TANL17/19.0*RAT20+
 1TANL18/20.0*RAT21+TANL19/21.0*RAT22+TANL20/22.0*RAT23+
 1TANL21/23.0*RAT24+TANL22/24.0*RAT25+TANL23/25.0*RAT26+
 1TANL24/26.0*RAT27+TANL25/27.0*RAT28+TANL26/28.0*RAT29+
 1TANL27/29.0*RAT30+TANL28/30.0*RAT31+TANL29/31.0*RAT32+
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 RAT359+TANL357/359.0*RAT360+TANL358/360.0

85 CONTINUE
 Q1=E *R10+E1*R11+E2*R12+E3*R13
 Q2=E *R20+E1*R21+E2*R22+E3*R23
 Q3=E *R30+E1*R31+E2*R32+E3*R33

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Q4=E *R40+E1*R41+E2*R42+E3*R43
Q5=E *R50+E1*R51+E2*R52+E3*R53

Q6=E *R60+E1*R61+E2*R62+E3*R63

Q7=E *R70+E1*R71+E2*R72+E3*R73

Q8=E *R80+E1*R81+E2*R82+E3*R83

Q9=E *R90+E1*R91+E2*R92+E3*R93

Q10=E *R100+E1*R101+E2*R102+E3*R103

Q11=E *R110+E1*R111+E2*R112+E3*R113

Q12=E *R120+E1*R121+E2*R122+E3*R123

Q13=E *R130+E1*R131+E2*R132+E3*R133

Q14=E *R140+E1*R141+E2*R142+E3*R143

Q15=E *R150+E1*R151+E2*R152+E3*R153

Q16=E *R160+E1*R161+E2*R162+E3*R163

Q17=E *R170+E1*R171+E2*R172+E3*R173

Q18=E *R180+E1*R181+E2*R182+E3*R183

Q19=E *R190+E1*R191+E2*R192+E3*R193

Q20=E *R200+E1*R201+E2*R202+E3*R203

Q21=E *R210+E1*R211+E2*R212+E3*R213

Q22=E *R220+E1*R221+E2*R222+E3*R223

Q23=E *R230+E1*R231+E2*R232+E3*R233

Q24=E *R240+E1*R241+E2*R242+E3*R243

Q25=E *R250+E1*R251+E2*R252+E3*R253

Q26=E *R260+E1*R261+E2*R262+E3*R263

Q27=E *R270+E1*R271+E2*R272+E3*R273

Q28=E *R280+E1*R281+E2*R282+E3*R283

Q29=E *R290+E1*R291+E2*R292+E3*R293

Q30=E *R300+E1*R301+E2*R302+E3*R303

Q31=E *R310+E1*R311+E2*R312+E3*R313

Q32=E *R320+E1*R321+E2*R322+E3*R323

Q33=E *R330+E1*R331+E2*R332+E3*R333

Q34=E *R340+E1*R341+E2*R342+E3*R343

Q35=E *R350+E1*R351+E2*R352+E3*R353

Q36=E *R360+E1*R361+E2*R362+E3*R363

Q37=E *R370+E1*R371+E2*R372+E3*R373

Q38=E *R380+E1*R381+E2*R382+E3*R383

Q39=E *R390+E1*R391+E2*R392+E3*R393

Q40=E *R400+E1*R401+E2*R402+E3*R403

Q41=E *R410+E1*R411+E2*R412+E3*R413

Q42=E *R420+E1*R421+E2*R422+E3*R423

Q43=E *R430+E1*R431+E2*R432+E3*R433

Q44=E *R440+E1*R441+E2*R442+E3*R443

Q45=E *R450+E1*R451+E2*R452+E3*R453

Q46=E *R460+E1*R461+E2*R462+E3*R463

Q47=E *R470+E1*R471+E2*R472+E3*R473

Q48=E *R480+E1*R481+E2*R482+E3*R483

Q49=E *R490+E1*R491+E2*R492+E3*R493

Q50=E *R500+E1*R501+E2*R502+E3*R503

Q51=E *R510+E1*R511+E2*R512+E3*R513

Q52=E *R520+E1*R521+E2*R522+E3*R523

Q53=E *R530+E1*R531+E2*R532+E3*R533

Q54=E *R540+E1*R541+E2*R542+E3*R543

Q55=E *R550+E1*R551+E2*R552+E3*R553

Q56=E *R560+E1*R561+E2*R562+E3*R563

Q57=E *R570+E1*R571+E2*R572+E3*R573

Q58=E *R580+E1*R581+E2*R582+E3*R583

Q59=E *R590+E1*R591+E2*R592+E3*R593

Q60=E *R600+E1*R601+E2*R602+E3*R603

Q61=E *R610+E1*R611+E2*R612+E3*R613

Q62=E *R620+E1*R621+E2*R622+E3*R623

Q63=E *R630+E1*R631+E2*R632+E3*R633

Q64=E *R640+E1*R641+E2*R642+E3*R643

Q65=E *R650+E1*R651+E2*R652+E3*R653

Q66=E *R660+E1*R661+E2*R662+E3*R663

Q67=E *R670+E1*R671+E2*R672+E3*R673

Q68=E *R680+E1*R681+E2*R682+E3*R683

Q69=E *R690+E1*R691+E2*R692+E3*R693

Q70=E *R700+E1*R701+E2*R702+E3*R703

Q71=E *R710+E1*R711+E2*R712+E3*R713

Q72=E *R720+E1*R721+E2*R722+E3*R723

Q73=E *R730+E1*R731+E2*R732+E3*R733

Q74=E *R740+E1*R741+E2*R742+E3*R743

Q75=E *R750+E1*R751+E2*R752+E3*R753

Q76=E *R760+E1*R761+E2*R762+E3*R763

Q77=E *R770+E1*R771+E2*R772+E3*R773

Q78=E *R780+E1*R781+E2*R782+E3*R783

Q79=E *R790+E1*R791+E2*R792+E3*R793

Q80=E *R800+E1*R801+E2*R802+E3*R803

Q81=E *R810+E1*R811+E2*R812+E3*R813

Q82=E *R820+E1*R821+E2*R822+E3*R823

Q83=E *R830+E1*R831+E2*R832+E3*R833

Q84=E *R840+E1*R841+E2*R842+E3*R843

Q85=E *R850+E1*R851+E2*R852+E3*R853

Q86=E *R860+E1*R861+E2*R862+E3*R863

Q87=E *R870+E1*R871+E2*R872+E3*R873

Q88=E *R880+E1*R881+E2*R882+E3*R883

Q89=E *R890+E1*R891+E2*R892+E3*R893

Q90=E *R900+E1*R901+E2*R902+E3*R903

Q91=E *R910+E1*R911+E2*R912+E3*R913

Q92=E *R920+E1*R921+E2*R922+E3*R923

Q93=E *R930+E1*R931+E2*R932+E3*R933

Q94=E *R940+E1*R941+E2*R942+E3*R943

Q95=E *R950+E1*R951+E2*R952+E3*R953

Q96=E *R960+E1*R961+E2*R962+E3*R963

Q97=E *R970+E1*R971+E2*R972+E3*R973

Q98=E *R980+E1*R981+E2*R982+E3*R983

Q99=E *R990+E1*R991+E2*R992+E3*R993

Q100=E *R1000+E1*R1001+E2*R1002+E3*R1003

Q101=E *R1010+E1*R1011+E2*R1012+E3*R1013

Q102=E *R1020+E1*R1021+E2*R1022+E3*R1023

Q103=E *R1030+E1*R1031+E2*R1032+E3*R1033

Q104=E *R1040+E1*R1041+E2*R1042+E3*R1043

Q105=E *R1050+E1*R1051+E2*R1052+E3*R1053

Q106=E *R1060+E1*R1061+E2*R1062+E3*R1063

Q107=E *R1070+E1*R1071+E2*R1072+E3*R1073

Q108=E *R1080+E1*R1081+E2*R1082+E3*R1083

Q109=E *R1090+E1*R1091+E2*R1092+E3*R1093

Q110=E *R1100+E1*R1101+E2*R1102+E3*R1103

Q111=E *R1110+E1*R1111+E2*R1112+E3*R1113

Q112=E *R1120+E1*R1121+E2*R1122+E3*R1123

Q113=E *R1130+E1*R1131+E2*R1132+E3*R1133

Q114=E *R1140+E1*R1141+E2*R1142+E3*R1143

Q115=E *R1150+E1*R1151+E2*R1152+E3*R1153

Q116=E *R1160+E1*R1161+E2*R1162+E3*R1163

Q117=E *R1170+E1*R1171+E2*R1172+E3*R1173

Q118=E *R1180+E1*R1181+E2*R1182+E3*R1183

Q119=E *R1190+E1*R1191+E2*R1192+E3*R1193

Q120=E *R1200+E1*R1201+E2*R1202+E3*R1203

Q121=E *R1210+E1*R1211+E2*R1212+E3*R1213

Q122=E *R1220+E1*R1221+E2*R1222+E3*R1223

Q123=E *R1230+E1*R1231+E2*R1232+E3*R1233

Q124=E *R1240+E1*R1241+E2*R1242+E3*R1243

Q125=E *R1250+E1*R1251+E2*R1252+E3*R1253

Q126=E *R1260+E1*R1261+E2*R1262+E3*R1263

Q127=E *R1270+E1*R1271+E2*R1272+E3*R1273

Q128=E *R1280+E1*R1281+E2*R1282+E3*R1283

Q129=E *R1290+E1*R1291+E2*R1292+E3*R1293

Q130=E *R1300+E1*R1301+E2*R1302+E3*R1303

Q131=E *R1310+E1*R1311+E2*R1312+E3*R1313

Q132=E *R1320+E1*R1321+E2*R1322+E3*R1323

Q133=E *R1330+E1*R1331+E2*R1332+E3*R1333

Q134=E *R1340+E1*R1341+E2*R1342+E3*R1343

Q135=E *R1350+E1*R1351+E2*R1352+E3*R1353

Q136=E *R1360+E1*R1361+E2*R1362+E3*R1363

Q137=E *R1370+E1*R1371+E2*R1372+E3*R1373

Q138=E *R1380+E1*R1381+E2*R1382+E3*R1383

Q139=E *R1390+E1*R1391+E2*R1392+E3*R1393

Q140=E *R1400+E1*R1401+E2*R1402+E3*R1403

Q141=E *R1410+E1*R1411+E2*R1412+E3*R1413

Q142=E *R1420+E1*R1421+E2*R1422+E3*R1423

Q143=E *R1430+E1*R1431+E2*R1432+E3*R1433

Q144=E *R1440+E1*R1441+E2*R1442+E3*R1443

Q145=E *R1450+E1*R1451+E2*R1452+E3*R1453

Q146=E *R1460+E1*R1461+E2*R1462+E3*R1463

Q147=E *R1470+E1*R1471+E2*R1472+E3*R1473

Q148=E *R1480+E1*R1481+E2*R1482+E3*R1483

Q149=E *R1490+E1*R1491+E2*R1492+E3*R1493

Q150=E *R1500+E1*R1501+E2*R1502+E3*R1503

Q151=E *R1510+E1*R1511+E2*R1512+E3*R1513

Q152=E *R1520+E1*R1521+E2*R1522+E3*R1523

Q153=E *R1530+E1*R1531+E2*R1532+E3*R1533

Q154=E *R1540+E1*R1541+E2*R1542+E3*R1543

Q155=E *R1550+E1*R1551+E2*R1552+E3*R1553

Q156=E *R1560+E1*R1561+E2*R1562+E3*R1563

Q157=E *R1570+E1*R1571+E2*R1572+E3*R1573

Q158=E *R1580+E1*R1581+E2*R1582+E3*R1583

Q159=E *R1590+E1*R1591+E2*R1592+E3*R1593

Q160=E *R1600+E1*R1601+E2*R1602+E3*R1603

Q161=E *R1610+E1*R1611+E2*R1612+E3*R1613

Q162=E *R1620+E1*R1621+E2*R1622+E3*R1623

Q163=E *R1630+E1*R1631+E2*R1632+E3*R1633

Q164=E *R1640+E1*R1641+E2*R1642+E3*R1643

Q165=E *R1650+E1*R1651+E2*R1652+E3*R1653

Q166=E *R1660+E1*R1661+E2*R1662+E3*R1663

Q167=E *R1670+E1*R1671+E2*R1672+E3*R1673

Q168=E *R1680+E1*R1681+E2*R1682+E3*R1683

Q169=E *R1690+E1*R1691+E2*R1692+E3*R1693

Q170=E *R1700+E1*R1701+E2*R1702+E3*R1703

Q171=E *R1710+E1*R1711+E2*R1712+E3*R1713

Q172=E *R1720+E1*R1721+E2*R1722+E3*R1723

Q173=E *R1730+E1*R1731+E2*R1732+E3*R1733

Q174=E *R1740+E1*R1741+E2*R1742+E3*R1743

Q175=E *R1750+E1*R1751+E2*R1752+E3*R1753

Q176=E *R1760+E1*R1761+E2*R1762+E3*R1763

Q177=E *R1770+E1*R1771+E2*R1772+E3*R1773

Q178=E *R1780+E1*R1781+E2*R1782+E3*R1783

Q179=E *R1790+E1*R1791+E2*R1792+E3*R1793

Q180=E *R1800+E1*R1801+E2*R1802+E3*R1803

Q181=E *R1810+E1*R1811+E2*R1812+E3*R1813

Q182=E *R1820+E1*R1821+E2*R1822+E3*R1823

Q183=E *R1830+E1*R1831+E2*R1832+E3*R1833

Q184=E *R1840+E1*R1841+E2*R1842+E3*R1843

Q185=E *R1850+E1*R1851+E2*R1852+E3*R1853

Q186=E *R1860+E1*R1861+E2*R1862+E3*R1863

Q187=E *R1870+E1*R1871+E2*R1872+E3*R1873

Q188=E *R1880+E1*R1881

AERODYNAMIC INFLUENCE COEFFICIENTS 4/06/62

94 WRITE OUTPUT TAPE NTAPE3, 17, VBRW(K), XMACHS(J), ISTRIP

DO 103 I=1, ISTRIP

IF (VBRW(K)) 97, 97, 98

C OSCILLATORY AERODYNAMIC COEFFICIENTS-STEADY CASE

97

XLAO(2)=0.

XMHO(1)=0.

XMHO(2)=0.

98

CAY=BI(1)/(VBRW(K)*BR)

GOTO 99

98 CAY=BI(1)/(VBRW(K)*BR)

XLAO(2)=RB3(1)/CAY+BB4(1)*CAY

XMHO(1)=C2(1)

XMHO(2)=C3(1)/CAY+C4(1)*CAY

99 ZEE=BI(1)/DI(1)

WHY=1.0+.5*ZEE

CH(1,N+2,I)=EX*(-.5*ZEE*WHY*XLHO(N)+.5*(ZEE**2)*XMHO(N)+ZEE*WHY

*XLAO(N)-ZEE**2*XMHO(N))

1 CH(2,N,I)=EX*(-.5*ZEE*WHY*XLHO(N)+ZEE*WHY*XMHO(N)+.5*(ZEE**2)

99

CH(1,N+2,I)=EX*(-.5*ZEE*WHY*XLHO(N)+.5*(ZEE**2)*XMHO(N)+ZEE*WHY

*XLAO(N)-ZEE**2*XMHO(N))

1 CH(2,N,I)=EX*(-.5*ZEE*WHY*XLHO(N)+ZEE*WHY*XMHO(N)+.5*(ZEE**2)

99

CH(1,N+2,I)=EX*(-.5*ZEE*WHY*XLHO(N)+.5*(ZEE**2)*XMHO(N)+ZEE*WHY

*XLAO(N)-ZEE**2*XMHO(N))

1 CH(2,N,I)=EX*(-.5*ZEE*WHY*XLHO(N)+ZEE*WHY*XMHO(N)+.5*(ZEE**2)

AEROODYNAMIC INFLUENCE COEFFICIENTS 4/06/62

1 *XLAO(N)-(ZEE**2)*XMAO(N))
CH(2,N+2,1)=EX*((ZEE**2)*(.25*XLHO(N)-.5*(XLAO(N)+XMHO(N)))+

HM100532
HM100533
HM100534
HM100535
HM100536
HM100537
HM100538
HM100539
HM100540
HM100541
HM100542
HM100543
HM100544
HM100545
HM100546
HM100547
HM100548
HM100549
HM100550
HM100551
HM100552

END OF DATA

100 CONTINUE

M=M+1

WRITE OUTPUT TAPE NTAPE3, 18, M

IF (VBRW(K)) 101,101,102

101 WRITE OUTPUT TAPE NTAPE3, 19, CH(1,1,1),CH(1,3,1),CH(2,1,1),

CH(2,3,1)

102

WRITE OUTPUT TAPE NTAPE3, 20, ((CH(1,1,1),12,1),12=1,4),11=1,2)

103 CONTINUE

IF (MOPUNJ) 105,104,105

104 CALL AEROP3 (VBRW(K),XNACHS(I,J),CH,ISTRIP,NCARDS,NTAPE3,NTAPE7)

105 CONTINUE

106 CONTINUE

GO TO 90

(0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0)

STORAGE NOT USED BY PROGRAM

DEC	OCT	DEC	OCT
5434	12472	11836	76734

STORAGE LOCATIONS FOR VARIABLES APPEARING IN COMMON STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT
A11	32361	77151	A12	32336	77120	A13	32311
A15	32346	76610	A16	32311	76557	A17	32086
A14	32211	76723	AK1	32186	76672	AR	32286
CH	32036	76444	DELY	32511	77377	DI	32536
DISTO	32261	77005	TAU	32386	77202	VBRW	32461
XMC	32411	77233					

STORAGE LOCATIONS FOR VARIABLES APPEARING IN DIMENSION AND EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT
A2	5408	12440	A3	5333	12325	A4	5258
AK3	5398	12356	AL1	5203	12243	AL2	5183
BB2	5088	11620	BB3	4933	11585	BB4	4908
C3	5133	12015	C4	5033	11651	DI	5158
D3	4983	11567	D4	4958	11536	XLAO	5308
XMAO	5108	11764	XMHO	5208	12130	XLHO	5383

STORAGE LOCATIONS FOR VARIABLES NOT APPEARING IN COMMON, DIMENSION, OR EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT
A01	4883	11423	A02	4882	11422	A11	4881
A13	4879	11417	A14	4878	11416	A15	4877
A22	4875	11413	A23	4874	11412	A24	4873
A26	4871	11407	A27	4870	11406	A31	4869
A33	4867	11383	A34	4866	11402	A35	4865
A37	4863	11377	A38	4862	11376	A39	4861
ARE	4859	11373	B2	4858	11372	B3	4857
B5	4855	11367	B6	4854	11366	B8	4853
BETA3	4851	11363	BETA4	4850	11362	BETA5	4849
BR	4847	11357	B	4846	11356	CAPS	4845

AEROBYNAMICS INFORMATION COEFFICIENTS 4/06/62											
CBAR	4843	11353	COSLA	4842	11352	CT2	4841	11351	CT3	4840	11350
CT4	4839	11347	CT5	4838	11346	CT6	4837	11345	CT7	4836	11344
CT8	4835	11343	CT9	4834	11342	CT10	4833	11341	CT11	4832	11340
DEEP	4831	11337	DIST12	4830	11336	DIST13	4829	11335	DIST14	4828	11334
DIST15	4827	11333	DIST16	4826	11332	DIST17	4825	11331	DIST18	4824	11330
DIST19	4823	11327	DIST20	4822	11326	DIST21	4821	11325	DIST22	4820	11324
DIST23	4819	11323	DIST24	4818	11322	DIST25	4817	11321	DIST26	4816	11320
E2	4815	11317	E3	4814	11316	EEE	4813	11315	EM2	4812	11314
EM	4811	11313	EN	4810	11312	EX	4809	11311	FF1	4808	11310
F1	4807	11307	F2	4806	11306	FF1	4805	11305	FF2	4804	11304
FF3	4803	11303	FF4	4802	11302	FF5	4801	11301	GAMA	4800	11300
I	4799	11277	ISTHK	4798	11276	ISTIP	4797	11275	ISTRIP	4796	11274
IXMC	4795	11273	JMACH	4794	11272	JTAU	4793	11271	JTWO	4792	11270
KGAMA	4791	11267	K	4790	11266	KVBRW	4789	11265	L	4788	11264
M	4787	11263	NCARDS	4786	11262	NOFUNG	4785	11261	NTAPE2	4784	11260
NTAPE3	4783	11257	NTAPE7	4782	11256	Q1	4781	11255	Q2	4780	11254
Q3	4779	11253	Q4	4778	11252	Q5	4777	11251	R10	4776	11250
R11	4775	11247	R12	4774	11246	R13	4773	11245	R20	4772	11244
R21	4771	11243	R22	4770	11242	R23	4769	11241	R30	4768	11240
R31	4767	11237	R32	4766	11236	R33	4765	11235	R40	4764	11234
R41	4763	11233	R42	4762	11232	R43	4761	11231	R50	4760	11230
R51	4759	11227	R52	4758	11226	R53	4757	11225	RATIO	4756	11224
RAT11	4755	11223	RAT12	4754	11222	RAT13	4753	11221	RAT14	4752	11220
RAT15	4751	11217	RAT1	4750	11216	RAT2	4749	11215	RAT3	4748	11214
RAT4	4747	11213	RAT5	4746	11212	RAT6	4745	11211	RAT7	4744	11210
RAT8	4743	11207	RAT9	4742	11206	SAVE	4741	11205	SMS	4740	11204
TANL10	4739	11203	TANL11	4738	11202	TANL12	4737	11201	TANL13	4736	11200
TANL14	4735	11197	TANL15	4734	11196	TANL16	4733	11195	TANL17	4732	11194
TANL18	4731	11193	TANL19	4730	11192	TANL20	4729	11191	TANL21	4728	11190
TANL22	4727	11187	TANL23	4726	11186	TANL24	4725	11185	TANL25	4724	11184
TANL26	4723	11183	TANL27	4722	11182	TANL28	4721	11181	TANL29	4720	11180
TANL30	4719	11179	TANL31	4718	11178	TANL32	4717	11177	TANL33	4716	11176
TANL34	4715	11175	TANL35	4714	11174	TANL36	4713	11173	TANL37	4712	11172
TANL38	4711	11171	TANL39	4710	11170	TANL40	4709	11169	TANL41	4708	11168
TANL42	4707	11167	TANL43	4706	11166	TANL44	4705	11165	TANL45	4704	11164
TANL46	4703	11163	TANL47	4702	11162	TANL48	4701	11161	TANL49	4700	11160
TANL50	4699	11159	TANL51	4698	11158	TANL52	4697	11157	TANL53	4696	11156
TANL54	4695	11155	TANL55	4694	11154	TANL56	4693	11153	TANL57	4692	11152
TANL58	4691	11151	TANL59	4690	11150	TANL60	4689	11149	TANL61	4688	11148
TANL62	4687	11147	TANL63	4686	11146	TANL64	4685	11145	TANL65	4684	11144
TANL66	4683	11143	TANL67	4682	11142	TANL68	4681	11141	TANL69	4680	11140
TANL70	4679	11139	TANL71	4678	11138	TANL72	4677	11137	TANL73	4676	11136
TANL74	4675	11135	TANL75	4674	11134	TANL76	4673	11133	TANL77	4672	11132
TANL78	4671	11131	TANL79	4670	11130	TANL80	4669	11129	TANL81	4668	11128
TANL82	4667	11127	TANL83	4666	11126	TANL84	4665	11125	TANL85	4664	11124
TANL86	4663	11123	TANL87	4662	11122	TANL88	4661	11121	TANL89	4660	11120
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TANL98	4651	11111	TANL99	4650	11110	TANL100	4649	11109	TANL101	4648	11108
TANL102	4647	11107	TANL103	4646	11106	TANL104	4645	11105	TANL105	4644	11104
TANL106	4643	11103	TANL107	4642	11102	TANL108	4641	11101	TANL109	4640	11100
TANL110	4639	11099	TANL111	4638	11098	TANL112	4637	11097	TANL113	4636	11096
TANL114	4635	11095	TANL115	4634	11094	TANL116	4633	11093	TANL117	4632	11092
TANL118	4631	11091	TANL119	4630	11090	TANL120	4629	11089	TANL121	4628	11088
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TANL162	4587	11047	TANL163	4586	11046	TANL164	4585	11045	TANL165	4584	11044
TANL166	4583	11043	TANL167	4582	11042	TANL168	4581	11041	TANL169	4580	11040
TANL170	4579	11039	TANL171	4578	11038	TANL172	4577	11037	TANL173	4576	11036
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TANL182	4567	11027	TANL183	4566	11026	TANL184	4565	11025	TANL185	4564	11024
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TANL262	4487	10947	TANL263	4486	10946	TANL264	4485	10945	TANL265	4484	10944
TANL266	4483	10943	TANL267	4482	10942	TANL268	4481	10941	TANL269	4480	10940
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TANL274	4475	10935	TANL275	4474	10934	TANL276	4473	10933	TANL277	4472	10932
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TANL314	4435	10895	TANL315	4434	10894	TANL316	4433	10893	TANL317	4432	10892
TANL318	4431	10891	TANL319	4430	10890	TANL320					

ARITHMETIC INFLUENCE COEFFICIENTS 4/06/62

EFN	LOC	EFN	LOC	EFN	LOC
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816	10743	817	15 10546	818	20 10473
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LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

	DEC	LOC	DEC	LOC	DEC	LOC					
1)	4681	11111	1)	4700	11134	2)	4348	10374	3)	4356	10404
4)	32767	77777	4)	4701	11135	6)	4399	10457	7)	4707	11143
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						C1G2	4710	11146			
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			C1G8	4720	11151				C1G6	4722	11164
			C1G0	4722	11152				C1G8	4724	11165
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			C1G4	4726	11154				C1G2	4728	11167
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			C1G8	4730	11156				C1G6	4732	11169
			C1G0	4732	11157				C1G8	4734	11170
			C1G2	4734	11158				C1G0	4736	11171
			C1G4	4736	11159				C1G2	4738	11172
			C1G6	4738	11160				C1G4	4740	11173
			C1G8	4740	11161				C1G6	4742	11174
			C1G0	4742	11162				C1G8	4744	11175
			C1G2	4744	11163				C1G0	4746	11176
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			C1G6	4748	11165				C1G4	4750	11178
			C1G8	4750	11166				C1G6	4752	11179
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			C1G2	4754	11168				C1G0	4756	11181
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			C1G6	4758	11170				C1G4	4760	11183
			C1G8	4760	11171				C1G6	4762	11184
			C1G0	4762	11172				C1G8	4764	11185
			C1G2	4764	11173				C1G0	4766	11186
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			C1G8	4770	11176				C1G6	4772	11189
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			C1G2	4774	11178				C1G0	4776	11191
			C1G4	4776	11179				C1G2	4778	11192
			C1G6	4778	11180				C1G4	4780	11193
			C1G8	4780	11181				C1G6	4782	11194
			C1G0	4782	11182				C1G8	4784	11195
			C1G2	4784	11183				C1G0	4786	11196
			C1G4	4786	11184				C1G2	4788	11197
			C1G6	4788	11185				C1G4	4790	11198
			C1G8	4790	11186				C1G6	4792	11199
			C1G0	4792	11187				C1G8	4794	11200
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			C1G6	4798	11190				C1G4	4800	11203
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			C1G8	4810	11196				C1G6	4812	11209
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			C1G4	4816	11199				C1G2	4818	11212
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			C1G8	4830	11206				C1G6	4832	11219
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			C1G4	4846	11214				C1G2	4848	11227
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			C1G8	4870	11226				C1G6	4872	11239
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			C1G8	4930	11256				C1G6	4932	11269
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			C1G6	4958	11270				C1G4	4960	11283
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AEROBYNAMIC INFLUENCE COEFFICIENTS 4/06/62

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813	3 10715	818	8 10715	819	9 10650
814	4 10650	819	9 10650	820	10 10537
815	5 10537	820	10 10537	821	11 10473
816	6 10473	821	11 10473	822	12 10404
817	7 10404	822	12 10404	823	13 10339
818	8 10339	823	13 10339	824	14 10274
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820	10 10209	825	15 10209	826	16 10144
821	11 10144	826	16 10144	827	17 10079
822	12 10079	827	17 10079	828	18 10014
823	13 10014	828	18 10014	829	19 9949
824	14 9949	829	19 9949	830	20 9884
825	15 9884	830	20 9884	831	21 9819
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828	18 9689	833	23 9689	834	24 9624
829	19 9624	834	24 9624	835	25 9559
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832	22 9429	837	27 9429	838	28 9364
833	23 9364	838	28 9364	839	29 9299
834	24 9299	839	29 9299	840	30 9234
835	25 9234	840	30 9234	841	31 9169
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839	29 8974	844	34 8974	845	35 8909
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842	32 8779	847	37 8779	848	38 8714
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846	36 8519	851	41 8519	852	42 8454
847	37 8454	852	42 8454	853	43 8389
848	38 8389	853	43 8389	854	44 8324
849	39 8324	854	44 8324	855	45 8259
850	40 8259	855	45 8259	856	46 8194
851	41 8194	856	46 8194	857	47 8129
852	42 8129	857	47 8129	858	48 8064
853	43 8064	858	48 8064	859	49 7999
854	44 7999	859	49 7999	860	50 7934
855	45 7934	860	50 7934	861	51 7869
856	46 7869	861	51 7869	862	52 7804
857	47 7804	862	52 7804	863	53 7739
858	48 7739	863	53 7739	864	54 7674
859	49 7674	864	54 7674	865	55 7609
860	50 7609	865	55 7609	866	56 7544
861	51 7544	866	56 7544	867	57 7479
862	52 7479	867	57 7479	868	58 7414
863	53 7414	868	58 7414	869	59 7349
864	54 7349	869	59 7349	870	60 7284
865	55 7284	870	60 7284	871	61 7219
866	56 7219	871	61 7219	872	62 7154
867	57 7154	872	62 7154	873	63 7089
868	58 7089	873	63 7089	874	64 7024
869	59 7024	874	64 7024	875	65 6959
870	60 6959	875	65 6959	876	66 6894
871	61 6894	876	66 6894	877	67 6829
872	62 6829	877	67 6829	878	68 6764
873	63 6764	878	68 6764	879	69 6699
874	64 6699	879	69 6699	880	70 6634
875	65 6634	880	70 6634	881	71 6569
876	66 6569	881	71 6569	882	72 6504
877	67 6504	882	72 6504	883	73 6439
878	68 6439	883	73 6439	884	74 6374
879	69 6374	884	74 6374	885	75 6309
880	70 6309	885	75 6309	886	76 6244
881	71 6244	886	76 6244	887	77 6179
882	72 6179	887	77 6179	888	78 6114
883	73 6114	888	78 6114	889	79 6049
884	74 6049	889	79 6049	890	80 5984
885	75 5984	890	80 5984	891	81 5919
886	76 5919	891	81 5919	892	82 5854
887	77 5854	892	82 5854	893	83 5789
888	78 5789	893	83 5789	894	84 5724
889	79 5724	894	84 5724	895	85 5659
890	80 5659	895	85 5659	896	86 5594
891	81 5594	896	86 5594	897	87 5529
892	82 5529	897	87 5529	898	88 5464
893	83 5464	898	88 5464	899	89 5399
894	84 5399	899	89 5399	900	90 5334
895	85 5334	900	90 5334	901	91 5269
896	86 5269	901	91 5269	902	92 5204
897	87 5204	902	92 5204	903	93 5139
898	88 5139	903	93 5139	904	94 5074
899	89 5074	904	94 5074	905	95 5009
900	90 5009	905	95 5009	906	96 4944
901	91 4944	906	96 4944	907	97 4879
902	92 4879	907	97 4879	908	98 4814
903	93 4814	908	98 4814	909	99 4749
904	94 4749	909	99 4749	910	100 4684
905	95 4684	910	100 4684	911	101 4619
906	96 4619	911	101 4619	912	102 4554
907	97 4554	912	102 4554	913	103 4489
908	98 4489	913	103 4489	914	104 4424
909	99 4424	914	104 4424	915	105 4359
910	100 4359	915	105 4359	916	106 4294
911	101 4294	916	106 4294	917	107 4229
912	102 4229	917	107 4229	918	108 4164
913	103 4164	918	108 4164	919	109 4099
914	104 4099	919	109 4099	920	110 4034
915	105 4034	920	110 4034	921	111 3969
916	106 3969	921	111 3969	922	112 3904
917	107 3904	922	112 3904	923	113 3839
918	108 3839	923	113 3839	924	114 3774
919	109 3774	924	114 3774	925	115 3709
920	110 3709	925	115 3709	926	116 3644
921	111 3644	926	116 3644	927	117 3579
922	112 3579	927	117 3579	928	118 3514
923	113 3514	928	118 3514	929	119 3449
924	114 3449	929	119 3449	930	120 3384
925	115 3384	930	120 3384	931	121 3319
926	116 3319	931	121 3319	932	122 3254
927	117 3254	932	122 3254	933	123 3189
928	118 3189	933	123 3189	934	124 3124
929	119 3124	934	124 3124	935	125 3059
930	120 3059	935	125 3059	936	126 2994
931	121 2994	936	126 2994	937	127 2929
932	122 2929	937	127 2929	938	128 2864
933	123 2864	938	128 2864	939	129 2799
934	124 2799	939	129 2799	940	130 2734
935	125 2734	940	130 2734	941	131 2669
936	126 2669	941	131 2669	942	132 2604
937	127 2604	942	132 2604	943	133 2539
938	128 2539	943	133 2539	944	134 2474
939	129 2474	944	134 2474	945	135 2409
940	130 2409	945	135 2409	946	136 2344
941	131 2344	946	136 2344	947	137 2279
942	132 2279	947	137 2279	948	138 2214
943	133 2214	948	138 2214	949	139 2149
944	134 2149	949	139 2149	950	140 2084
945	135 2084	950	140 2084	951	141 2019
946	136 2019	951	141 2019	952	142 1954
947	137 1954	952	142 1954	953	143 1889
948	138 1889	953	143 1889	954	144 1824
949	139 1824	954	144 1824	955	145 1759
950	140 1759	955	145 1759	956	146 1694
951	141 1694	956	146 1694	957	147 1629
952	142 1629	957	147 1629	958	148 1564
953	143 1564	958	148 1564	959	149 1499
954	144 1499	959	149 1499	960	150 1434
955	145 1434	960	150 1434	961	151 1369
956	146 1369	961	151 1369	962	152 1304
957	147 1304	962	152 1304	963	153 1239
958	148 1239	963	153 1239	964	154 1174
959	149 1174	964	154 1174	965	155 1109
960	150 1109	965	155 1109	966	156 1044
961	151 1044	966	156 1044	967	157 979
962	152 979	967	157 979	968	158 914
963	153 914	968	158 914	969	159 849
964	154 849	969	159 849	970	160 784
965	155 784	970	160 784	971	161 719
966	156 719	971	161 719	972	162 654
967	157 654	972	162 654	973	163 589
968	158 589	973	163 589	974	164 524
969	159 524	974	164 524	975	165 459
970	160 459	975	165 459	976	166 394
971	161 394	976	166 394	977	167 329
972	162 329	977	167 329	978	168 264
973	163 264	978	168 264	979	169 199
974	164 199	979	169 199	980	170 134
975	165 134	980	170 134	981	171 69
976	166 69	981	171 69	982	172 0
977	167 0	982	172 0	983	173 0
978	168 0	983	173 0	984	174 0
979	169 0	984	174 0	985	175 0
980	170 0	985	175 0	986	176 0
981	171 0	986	176 0	987	177 0
982	172 0	987	177 0	988	178 0
983	173 0	988	178 0	989	179 0
984	174 0	989	179 0	990	180 0
985	175 0	990	180 0	991	181 0
986	176 0	991	181 0	992	182 0
987	177 0	992	182 0	993	183 0
988	178 0	993	183 0	994	184 0
989	179 0	994	184 0	995	185 0
990	180 0	995	185 0	996	186 0
991	181 0	996	186 0	997	187 0
992	182 0	997	187 0	998	188 0
993	183 0	998	188 0	999	189 0
994	184 0	999	189 0	1000	190 0
995	185 0				

DEC OCT DEC OCT DEC OCT
 4332 10354 SOME 4337 10361

EXTERNAL FORMULA NUMBERS WITH CORRESPONDING INTERNAL FORMULA NUMBERS AND OCTAL LOCATIONS

EFN	IFN	LFC	EFN	IFN	LFC	EFN	IFN	LFC	EFN	IFN	LFC
50	32	00032	51	69	00236	52	72	00244	53	74	00250
54	86	00312	55	91	00331	56	95	00354	57	96	00361
58	102	00430	59	106	00437	60	110	00446	61	113	00454
64	147	00602	66	148	00606	67	170	01372	68	171	01402
70	184	01474	71	187	01507	72	234	02534	73	237	02551
74	243	02564	75	253	02677	76	254	02705	77	255	02707
78	274	03030	79	280	03032	80	288	03537	81	295	04123
82	311	05117	83	346	05364	84	354	06313	85	362	07142
86	374	07475	88	376	07505	89	377	07511	90	391	07563
91	392	07570	92	395	07607	93	397	07616	94	398	07624
97	403	07671	98	413	07717	99	423	10022	100	430	10177
101	435	10226	102	438	10250	103	445	10275	104	447	10321
105	449	10344	106	450	10350						

4/06/62

HM100554
HM100555

SUBROUTINE RDLN (NTAPE2, NTAPE3, I)
1 FORMAT(80H

HM100556
HM100557
HM100558
HM100559
HM100560
HM100561

READ INPUT TAPE NTAPE2, 1
GOTO (4,5),1

HM100562
HM100563
HM100564
HM100565
HM100566
HM100567

5 WRITE OUTPUT TAPE NTAPE3, 3

END(1,0,0,0,0,0,0,0,1,0,0,0,0,0)

STORAGE NOT USED BY PROGRAM

DEC	OCT	98C	OCT
16 00114		32561	72661

SYMBOLS AND LOCATIONS FOR SOURCE PROGRAM FORMAT STATEMENTS

EFN	LOC	EFN	LOC	EFN	LOC
011	1 00112	812	2 00073	913	3 00072

LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

DEC	OCT	DEC	OCT	DEC	OCT
61	52 00064	C160	75 00112	E11	24 00034

LOCATIONS OF NAMES IN TRANSFER VECTOR

DEC	OCT	DEC	OCT	DEC	OCT
(FIL)	3 00003	(RTN)	1 00001	(STH)	2 00002
				(TSH)	0 00000

ENTRY POINTS TO SUBROUTINES NOT OUTPUT FROM LIBRARY

(FIL)	(RTN)	(STH)	(TSH)
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EXTERNAL FORMULA NUMBERS WITH CORRESPONDING INTERNAL FORMULA NUMBERS AND OCTAL LOCATIONS

EFN	LOC	EFN	LOC	EFN	LOC
4	8 00035	5	10 00044	6	11 00052

```

SUBROUTINE AEROP3 (VBRW,XMACH,CH,ISTRIP,NSTART,NTAPE3,NTAPE7)
DIMENSION CH(2,4,25), A(22)

1 FORMAT (12I12,8X,4BX,4HHM10,114)
2 FORMAT (11M8,40X,24H PUNCHED CARDS NOS., HM10,114)
3 FORMAT (10H THRU HM10,114)
3 FORMAT (214,64X,4HHM10,114)

4 DO 10 I=1,ISTRIP
   IF (VBRW) 4,4,5
   NITS=1
   IF (VBRW)
     4 NITS=2
   5 WRITE OUTPUT TAPE NTAPE7, 1, VBRW,XMACH,IS
   15=IS+1
   K=2+ISTRIP
   WRITE OUTPUT TAPE NTAPE7, 3, K,ISTRIP,IS
   IS=IS+1
   NITS=4
   DO 6 I=1,22
     6 A(I)=0.
     N=0
     DO 11 I=1,ISTRIP
       DO 10 L=1,NITS,NITS
         DO 9 J=1,2
           N=N+1
           IF (N-23) 9,7,7
           7 CALL BINPU (A,22,IORG,BCDZ,IS,NTAPE7)
           IORG=IORG+22
           IS=IS+1
           DO 8 M=1,22
             A(M)=0.
             IF (M-23) 9,7,7
             9 A(M)=CH(J,L,I)
             ICONFZ=I+J+L
             10 M=M+K-2

```

HM100572
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 HM100604
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 HM100606
 HM100607
 HM100608
 HM100609

```

11 M=M+2
M=M-K
IF (M) 13,13,17
12 CALL BINPU (A,0,0,BCDZ,IS,NTAPE7)
13 CALL BINPU (A,0,0,BCDZ,IS,NTAPE7)
WRITE OUTPUT TAPE NTAPE3, 2, NSTART, IS
NSTART=IS+1
RETURN
END

```

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HM100610
HM100611
HM100612
HM100613
HM100614
HM100615
HM100616
HM100617
HM100618

```

DEC	DEC
119 00577	32561 77061

[illegible]

	DEC	OCT	DEC	OCT	DEC	OCT		
D602	296	00490	I08G	295	00447	I	299	00445
IS	297	00444	J	291	00443	K	290	00442
			M075	287	00437	M075	296	00436

[illegible][illegible][illegible]

100

(STH)

EFN	IFN	LUC	EFN	IFN	LUC	EFN	IFN	LUC	EFN	IFN	LUC
4	12	00055	5	13	00057	6	22	00120	7	29	00207
8	35	00232	9	37	00242	10	39	00253	11	40	00271
12	43	00238	13	44	00242	14	45	00252	15	46	00252

HM100623
HM100624

2005

Level of Problem	All respondents (%)	Respondents with a history of a mental health problem (%)
No problem	70	60
Mild problem	20	25
Moderate problem	10	15
Severe problem	5	10
Very severe problem	5	10

HM100628

HM100629

HM1G0630

1000

1000

Figure 6

HM100635
HM100636
~~HM100637~~

1000

THE

HM100642

HM100642

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

0.00

1. Name of the person or organization: _____
 2. Address: _____
 3. City: _____ State: _____ Zip: _____
 4. Telephone: _____
 5. E-mail: _____
 6. Date: _____
 7. Signature: _____
 8. Title: _____
 9. Organization: _____
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 302. Date: _____
 30

1. The first step is to identify the problem. This involves understanding the situation and the goals that need to be achieved.

Author's address: Department of Mathematics, University of California at San Diego, La Jolla, CA 92037, USA.
E-mail: shashank@ucsd.edu

HM100644

HM100645

94900TWH

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 90
 80
 70
 60
 50
 40
 30
 20
 10
 0

HW100649

HM100650

HM100651

[illegible][illegible][illegible]

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68

BINPU ROUTINE TO WRITE GOL BIN CARDS ON TAPE. FINI

4/06/62 PAGE 2

00016	C402	00	0	00325	SUB	D1	HM100652
00017	0622	00	0	00066	STD	LOCN	HM100653
00020	0634	00	0	00061	SXA	COUNT,0	HM100654
00021	0500	00	4	00000	CLP*	3,4	HM100655
00022	0711	00	0	00012	SEL	18	HM100656
00023	-0120	00	0	00025	THI	**2	HM100657
00024	-0501	00	0	00266	ORA	REL	HM100658
00025	-0501	00	0	00334	ORA	IMAGE	HM100659
00026	0002	00	0	77740	SLW	CIMAGE	HM100660

* TEST FOR FOURTH AND ON FIFTH ARGUMENTS.							
* DETERMINE WHETHER ARGUMENT REFERS TO ID OR SEQ NUMBER							
* AND SET CELLS FROM CALLING SEQUENCE.							

00027	0774	00	2	00002	BNF	2+2	HM100661
00030	-0625	00	0	00302	SLW	BLSEQ	HM100662
00031	-0500	00	4	00004	CLP	6,4	HM100663
00032	-0320	00	0	00265	ANA	MSKPD1	HM100664
00033	0322	00	0	00307	FRA	MSKTSX	HM100665
00034	-0100	00	0	00054	TNZ	G2	HM100666
00035	0500	00	4	00004	CLP*	4+4	HM100667
00036	-0340	00	0	00262	SLW	BLSEQ	HM100668
00037	0030	00	0	00041	SLW	BLSEQ	HM100669
00040	0600	00	0	00302	STZ	BLSEQ	HM100670
00041	-0100	00	0	00043	TNZ	**2	HM100671
00042	-0754	00	0	00000	PXD		HM100672
00043	-0130	00	0	00200	NGL		HM100673
00044	0034	00	4	00043	SXA	**2,4	HM100674
00045	0074	00	4	00172	SEL	CONV,4	HM100675
00046	0774	00	4	00000	AXT	**4	HM100676
00047	0602	00	0	00267	SLW	SEQNO	HM100677
00050	1 77777	4	00053		TXI	G5,4,-1	HM100678
00051	0001	00	0	00305	SFO	BCD10	HM100679
00052	1 77777	4	00053		TXI	G5,4,-1	HM100680
00053	2 00001	2	00031		SEL	G4,2,1	HM100681
00054	0634	00	4	00144	SXA	X4,4	HM100682
00055	-0520	00	0	77776	NZT	END	HM100683
00056	0020	00	0	00152	TRA	TRCD	HM100684

SET UP CONTROL WORD							
ADD RELATIVE BIT							
7-9, WORD COUNT=22							
CONTROL WORD ESTABLISHED.							

SET BLSEQ TO ITS NORMAL STATE							
TEST FOR 4TH, 5TH ARGS							
NO MORE TSXES							
BIG, THIS IS ID							
EQUAL, FLAG BLANK SEQ. NO.							
IS SEQ NO NON-ZERO.							
NO							
SMALL, THIS IS SEQ NO.							
CONVERT SEQ NO TO BCD							
SAVE							
MOVE TO NEXT ARGUMENT							
AT NEXT 2 EXTRA ARGS.							
IS WORD COUNT ZERO							
MUST BE A TRANSFER CARD							

[illegible]

BINPU ROUTINE TO WRITE COL BIN CARDS ON TAPE. FIBII

```

00113 0602 00 2 77734 SLW LAST+4,2 COL RIN AT LAST TO LAST+3 HM100728
00114 1 77777 2 00115 TXI **1,2,-1 HM100729
00115 2 00001 3 00109 TEE ABC-1,1,1 FINISH W/SAVED CEMOI. HM100730
00116 0500 00 0 00106 LHM IDIGO HM100731
00117 3 00000 2 00104 FHM ABC-1,2,0 HM100732
00120 0774 00 1 00000 SVI **1 HM100733
* HM100734
***** HM100735
* THE ENTIRE CARD IMAGE IS BUILT, WITH THE BOBBY HM100736
* AT CIMAGE THRU CIMAGE+23. AND ID AT LAST THRU LAST+3. HM100737
* NOW ***** WRITE THE CARD ON TAPE. ***** HM100738
***** HM100739
***** HM100740
00121 0761 00 0 00000 WRITE NOP HM100741
00122 -0500 00 0 00331 WRITE1 CAL 140 HM100742
00123 0074 00 0 00000 CMLL (EOS) HM100743
00124 0522 60 0 00001 REC* (EMER) HM100744
00125 -0774 00 0 00213 ABC PUNEND,4 HM100745
00126 0522 60 0 00002 REC* (STRCH) HM100746
00127 0754 00 4 00000 PXA 0,4 HM100747
00130 0621 60 0 00003 STA* 3(WTC) HM100748
00131 0074 00 0 00004 SPIES TSK SIEWER,4 HM100749
00132 -0500 00 0 00333 CAL SEQNO HM100750
00133 0400 00 0 00337 ADD LIT HM100751
00134 0114 06 0 00215 CVR TBL,6 HM100752
00135 0602 00 0 00267 SLW SEQNO HM100753
00136 0520 00 0 77776 ZET END HM100754
00137 0000 00 0 00100 TBA SWITCH HM100755
00138 -0500 00 0 00131 CAL WPFS HM100756
00141 0402 00 0 00005 SLW* (FIBII) HM100757
00142 0774 00 1 00000 X1 AXT **1 ALL DONE. EXIT HM100758
00143 0774 00 2 00000 X2 AXT **2 HM100759
00144 0774 00 4 00000 X4 AXT **4 HM100760
00145 0070 00 0 00005 TBA *** HM100761
***** HM100762
***** HM100763
00146 -0500 00 0 77740 SWITCH CAL CIMAGE UPDATE THE CARD ORIGIN. HM100764
00147 0361 00 0 00333 ACL A22 HM100765
00150 0602 00 0 77740 SLW CIMAGE

```

BINARY ROUTINE TO WRITE CON BIN CARDS ON TAPE. FIRST

00151	0020 00 0 00057	TRA	NEXT		HM100766

00152	0076 00 2 00057	INCO	RTX	23.2	HM100767
00153	0000 00 2 11770	STZ	CIMAGE+24.2		HM100768
00154	2 00001 2 00153	TIX	*-1,2,1		HM100769
00155	0500 00 0 00322	CLA	ZWC		HM100770
00156	0622 00 0 77740	STD	CIMAGE		HM100771
00157	0070 00 0 00073	TRA	COIT		HM100772

00160	0600 00 0 77776	OUT	END		HM100773
00161	-2 00001 2 00070	STX	IN,2,1		HM100774
00162	0002 00 0 77777	STN	COMMON		HM100775
00163	-0754 00 2 00000	PRD	0.2		HM100776
00164	0402 00 0 77740	SUB	CIMAGE		HM100777
00165	0622 00 0 77740	STD	CIMAGE		HM100778
00166	-0500 00 0 77777	CAL	COMMON		HM100779
00167	-3 00000 2 00070	TXL	IN,2,0		HM100780
00170	0400 00 2 77770	STZ	CIMAGE+24.2		HM100781
00171	1 77771 2 00167	TIX	*-2,2,-1		HM100782

00172	-0754 00 0 00000	PRD	COMMON		HM100783
00173	-0520 00 0 00302	RTX	CUSEQX		HM100784
00174	0020 00 0 00211	TRA	18		HM100785
00175	0765 00 0 00022	LRS	TEN		HM100786
00176	0221 00 0 00332	UVP	COMMON		HM100787
00177	0401 00 0 77777	STZ	CIMAGE		HM100788
00200	-0754 00 0 00000	PRD	COMMON		HM100789
00201	0421 00 0 00332	DVP	TEN		HM100790
00202	0767 00 0 00006	ALS	6		HM100791
00203	-0602 00 0 77777	ORS	COMMON		HM100792
00204	-0754 00 0 00000	PRD			HM100793

WORD COUNT EXHAUSTED
RETURN IF CARD IS FULL

SAVE CHECKSUM.
CORRECT WORD COUNT

RETURN CHECKSUM.

CLEAR REST 3F CARD.

* THIS ROUTINE CONVERTS A BINARY INTEGER TO BCD. (4 DIGITS DECR-MQ)

TEST IF BLENKS DESIRED.

RIGHT ADJUST BIN INTEGER

[illegible]

HM100815 *
HM100816 * YANIS FOR WCO ADDITION DE 1 TO C(ACC)
HM100817

* TABLES FOR BCD-COL. BIN. CONVERSION

[illegible]

1. The first part of the document is a title page. It contains the title "The Role of the State in the Development of the Economy" and the author's name "John Doe".

2. The second part of the document is an abstract. It provides a brief summary of the main findings of the study.

3. The third part of the document is the introduction. It discusses the importance of the state in the development of the economy and the objectives of the study.

4. The fourth part of the document is the literature review. It examines the existing research on the role of the state in the development of the economy.

5. The fifth part of the document is the methodology. It describes the research methods used in the study.

6. The sixth part of the document is the results. It presents the findings of the study.

7. The seventh part of the document is the conclusion. It summarizes the main findings and provides recommendations for future research.

8. The eighth part of the document is the references. It lists the sources used in the study.

9. The ninth part of the document is the appendix. It contains additional information related to the study.

10. The tenth part of the document is the index. It provides a list of the topics covered in the document.

1. The first part of the document is a title page. It contains the title "The Role of the State in the Development of the Economy" and the author's name "John Maynard Keynes".

2. The second part of the document is an introduction. It discusses the importance of the state in the development of the economy and the role of the state in the development of the economy.

3. The third part of the document is a chapter on the role of the state in the development of the economy. It discusses the role of the state in the development of the economy and the role of the state in the development of the economy.

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00316 +0000000001010
00317 +0000000001004
00320 +0000000001002

HM100849
HM100850

00324 +0000000001042
00325 0 00001 0 00000
00326 0 00000 0 00000 IDLCD PZE 0.0.1

HM100854
HM100855
HM100856

00332 +00000000000012 YEN DEC 10
00333 0000 00 0 00026 A22 HTR 22
00334 +0005260000000 IMAGE OCT 0005260000000 CONTROL WORD SKELETON

HM100860
HM100861

77776 END SYN COMMON-1
END

4/06/62

POST PROCESSOR ASSEMBLY DATA

335 IS THE FIRST LOCATION NOT USED BY THIS PROGRAM

330 5A
325 D1 16
54 G2 34
70 IN 161, 167
216 T8 227
142 X1 6

333 A22 147
105 ABC 115, 117
77776 END 15, 55, 136, 160

230 TAB 107
215 T81 134, 215, 216, 217, 220, 221, 222, 223, 224, 225, 226
332 TEN 176, 201, 205

77730 LAST 113, 214
66 LOCN 17
327 L(1) 74, 133

305 BCDID 51, 76
6 BINPU 0
306 BLANK 211

4/06/82

POST PROCESSOR ASSEMBLY DATA

131 BPTES 140
326 IDLCD 100, 116
334 IMAGE 25
267 SEQNO 47, 73, 132, 135
2 (RCH) 126
5 (TES) 141
4 (WER) 131
77777 COMMON 162, 166, 177, 203, 207, 335
211 COSEQX 174
242 MSK2CH
209 MSK2CH 32
207 MSK2CH 35
213 MSK2CH 135
122 WRITE1

NO ERROR IN ABOVE ASSEMBLY.

<p style="text-align: center;">UNCLASSIFIED</p>	<p>Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SUPERSONIC STRIP THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E. F. Farkas, H. A. Malcom, and A. M. Kliszewski. 1 August 1962. [47]p. incl. illus, tables. (Report TDR-169(3230-11)TN-1; SSD-TDR-62-74) (Contract AF 04(695)-169) Unclassified report</p> <p>In this report, we review a method for computing the aerodynamic influence coefficients (AICs) for surfaces with supersonic leading edges. The method is based on the two-dimensional second- order potential solution of Van Dyke. The strip oscillatory coefficients are obtained from the ex- tension of Van Dyke's work by Rodden and Revell to include the effects of sweep and finite span in addition to the effects of thickness, leading to a method that will avoid the unconservatism (over)</p> <p style="text-align: center;">UNCLASSIFIED</p>
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UNCLASSIFIED	<p>of linearized theory and will be applicable at Mach numbers below the lower Mach number limit of piston theory. The influence coefficients relate the aerodynamic forces to the surface deflections through the following definitions. In the oscillatory case, $\{F\} = \rho_0^2 b_r^2 s [C_h] \{h\}$, and in the steady case, $\{F_s\} = (1/2) \rho V^2 (S/c) [C_{hs}] \{h\}$. The Aerospace IBM 7090 Computer Program No. HM10 provides the AICs in printed and optional punched-card output formats. The theoretical formulation is limited to Mach numbers normal to the leading edge greater than 1.25. The program capacity is 25 surface strips, 25 values of Mach number, and 50 values of reduced velocity.</p>
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UNCLASSIFIED	<p>of linearized theory and will be applicable at Mach numbers below the lower Mach number limit of piston theory. The influence coefficients relate the aerodynamic forces to the surface deflections through the following definitions. In the oscillatory case, $\{F\} = \rho_0^2 b_r^2 s [C_h] \{h\}$, and in the steady case, $\{F_s\} = (1/2) \rho V^2 (S/c) [C_{hs}] \{h\}$. The Aerospace IBM 7090 Computer Program No. HM10 provides the AICs in printed and optional punched-card output formats. The theoretical formulation is limited to Mach numbers normal to the leading edge greater than 1.25. The program capacity is 25 surface strips, 25 values of Mach number, and 50 values of reduced velocity.</p>
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